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ABSTRACT

Summarized are 68 research studies from 1970 to 1975 on the Revised Illinois Test of Psycholinguistic Abilities (ITPA), particularly as it relates to learning disabilities. The reviews have been organized by the following areas (the number of studies in each section and sample study topics are in parentheses): studies comparing the experimental and revised editions of the ITPA (two studies including the performance of institutionalized retardates on the Peabody Picture Vocabulary Test and the two editions of the ITPA); validity studies (16 studies including a factor analysis of the revised ITPA with underachieving children); screening, prediction, and diagnostic studies (eight studies including an evaluation of several methods of predicting full-scale IQ from the ITPA); clinical, ethnic, and/or social class studies (12 studies including an examination of psycholinguistic abilities of grade 2 children of differing socioeconomic and ethnic background); school achievement studies on reading (12 studies including reading and psycholinguistic processes of inmate problem readers); school achievement studies on spelling (two studies including the relationships between written spelling, motor functioning, and sequencing skills); and remediation studies (10 studies including an evaluation of the effectiveness of an enriched curriculum in overcoming the consequences of environmental deprivation). One-page summaries provide study information such as author, title, source, purpose, subjects, procedure, results, and comments. An additional section on short reports contains brief descriptions of six studies. (SB)

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RESEARCH REPORT

SUMMARIES OF RESEARCH ON THE REVISED ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES

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Leadership Training Institute in Learning Disabilities
Department of Special Education
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PREFACE

In 1961 the experimental edition of the ITPA was published. This edition resulted in a series of research studies which were summarized by Barbara Bateman in The Illinois Test of Psycholinguistic Abilities in Current Research, University of Illinois Press, 1965. Selected research studies up to 1970 were included in Kirk and Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation, University of Illinois Press, 1971.

The Revised edition of the ITPA was published in the fall of 1968, with an accompanying book, the Development and Psychometric Characteristics of the Revised Illinois Test of Psycholinguistic Abilities, by Paraskevopoulos and Kirk, 1969. Since those dates, research studies have been reported in increasing numbers in the literature in numerous periodicals.

The present compilation of research studies on the Revised ITPA was summarized by perusing journals and dissertation abstracts. It is hoped that most of the studies from 1970 to April, 1975 have been located. The reviews have been organized by topics and numbered 1A, 2A, 1B, 2B, etc., so that additional reviews can be appropriately inserted in the manuscript as they become available without changing pagination. The authors are indebted to Nancy Stiefel, Janet Andrews, and Marie Wittwer, graduate assistants, and to Dr. Aldine von Isser, for help in locating and summarizing the studies.

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Smallest space analysis of the revised Illinois Test of Psycholinguistic Abilities. Psychology in the Schools, 1973, 10, 107-110.

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The use of the revised ITPA with some Queensland children. Australian Psychology, 1974, 9, 71-77.

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Fiester, A., and Giambra, L. M. C 3
Language indices of vocational success in mentally retarded adults. American Journal of Mental Deficiency, 1972, 77, 332-337.

Humphrey, J., and Rice, A. C 4
An evaluation of several methods of predicting full-scale IQ from the ITPA. The Journal of Special Education, 1973, 7, 133-140.

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Differentiating elementary children with learning disabilities using the Illinois Test of Psycholinguistic Abilities. Unpublished doctoral dissertation, East Texas State University, 1972.

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Perceptual and cognitive characteristics and their relationship to social factors and academic achievement in third grade conduct problem boys. Unpublished doctoral dissertation, University of Illinois, 1969.

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Psycholinguistic differences of monolingual and bilingual culturally-deprived children. Unpublished masters thesis, Colorado State University, 1970.

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Cultural deprivation and language defect: Project Enrichment of Childhood. Australian Psychologist, 1970, 5, 249-259.

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Visual sequential memory in reading disability. Journal of Learning Disabilities, 1972, 5, 41-46.

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Who are the retarded? Exceptional Children, 1971, 38, 13-20.

Rasmussen, J. H 1
The ITPA: An examination of the background and development. Unpublished manuscript, Copenhagen, Denmark, 1970.

Sharp, E. Y. H 1
The relationship of visual closure to speechreading among deaf children. Exceptional Children, 1972, 38, 729-34.

Shriner, T. H., and Daniloff, R. G. H 2
Reassembly of segmented CVC syllables by children. Journal of Speech and Hearing Research, 1970, 13, 537-47.

Works, M. H. H 2
Some variables involved in the reading process. Unpublished doctoral dissertation, University of Oklahoma, 1970.

SECTION A

STUDIES COMPARING THE EXPERIMENTAL AND REVISED EDITIONS OF THE ITPA

Hubschman, E., Polizzotto, E. A., and Kaliski, M. S. Performance of institutionalized retardates on the PPVT and two editions of the ITPA. American Journal of Mental Deficiency, 1970, 74, 579-580.

Purpose

This study compared the performance of institutionalized female retardates on three tests: the experimental ITPA, the revised ITPA, and the Peabody Picture Vocabulary Test.

Subjects

The subjects were 53 female residents of a New Jersey institution for the mentally retarded with IQ's ranging from 22 to 66 (mean, 42.4) and CA's ranging from 7-10 to 20-7 (mean, 13-11).

Procedure

The experimental ITPA was given in 1968 and again a year later along with the revised ITPA and the PPVT. The latter administrations of the ITPA were given by two speech pathologists in separate sessions. A third speech pathologist administered the PPVT.

Results

1. High correlations were found on all three measures:

Experimental ITPA 1 and Experimental ITPA 2	.95
Experimental ITPA 2 and Revised ITPA	.93
Experimental ITPA 2 and PPVT	.71
Revised ITPA and PPVT	.73

2. The "t" tests of correlated means (performed on the same comparisons as listed above) revealed only one significant difference, that being between Experimental ITPA 1 and Experimental ITPA 2. This significant difference reflects the language development of the subjects during the year interval between administrations of the experimental ITPA.

3. The profiles of mean scores for the two editions of the ITPA were strikingly similar with the only real deviation being on the Visual Association subtest where there is a 15-month psycholinguistic language age difference in favor of the experimental edition.

Comments

These correlations did not partial out the CA and the IQ variables, which could account for the extremely high correlation between the experimental and revised editions.

Waugh, R. Comparison of revised and experimental editions of the Illinois Test of Psycholinguistic Abilities. Journal of Learning Disabilities, 1973, 63, 236-238.

Purpose

To compare the experimental and revised ITPA for kindergarten children.

Subjects

The subjects were thirty children (17 males and 13 females) randomly selected from kindergartens in a Title I program. (CA=73.1 months).

Procedure

The experimental and revised editions of the ITPA were administ to 30 kindergarten children. The administration of the test was counter-balanced with half the subjects receiving the revised edition before the experimental, and vice versa with the other half. Two weeks elapsed before the administration of the tests. Correlations between the two forms were compiled.

Results

The correlations for the subtests ranged from .25 to .74; with Grammatic Closure, Auditory Sequential Memory and Auditory Reception and their experimental counterparts correlation over .70. The rest were in the .60 correlation range with Visual Association correlating .25. The correlations were not as high as the five month test-retest study of the Revised ITPA by Paraskevopoulos and Kirk.

Comments

This study obtained lower correlations than A-1 since it controlled for age. The number 30 for correlational purposes is relatively small.

Anderson, A. H. and Novina, J. A study of relationships of the tests of central auditory abilities and the Illinois Test of Psycholinguistic Abilities. Journal of Learning Disabilities, 1973, 2, 167-169.

Purpose

This study examined the relationship of the Flower-Costello Tests of Central Auditory Abilities and the revised ITPA.

Subjects

Twenty kindergarten pupils (17 Mexican-Americans and 3 Blacks) from a school of predominantly minority enrollment in Orange County, California, constituted the sample.

Procedure

All subjects were administered the Tests of Central Auditory Abilities and the ITPA. Pearson product-moment correlation coefficients were computed among the subjects of the respective instruments.

Results

1. The TCAA total raw score was significantly related to five of the ITPA auditory subtests (Auditory Reception, Auditory Association, Verbal Expression, Grammatic Closure, and Sound Blending) and to the total scaled score.

2. The TCAA Competing Messages subtest scores appear to covary significantly with scores on the same five ITPA auditory subtests, with the total scaled score, and with Visual Closure.

3. The Low-Pass Filtered Speech subtest appears to be minimally related to the ITPA subtests, correlating significantly with only one subtest; Auditory Association.

Comments

It would appear that the Low-Pass Filtered Speech subtest assesses abilities for the most part separate from those utilized in the ITPA, thus making it a diagnostic counterpart rather than a duplication of certain of the ITPA subtests. The TCAA apparently taps abilities at predominantly the representational level.

Burns, G. W. and Watson, B. L. Factor analysis of the revised ITPA with underachieving children. Journal of Learning Disabilities, 1973, 6, 371-376.

Purpose

To establish the construct validity of the revised ITPA.

Subjects

Subjects were 90 children diagnosed as having learning difficulties. All subjects had IQ's above 85, with CA ranging from 5-1 to 9-11.

Procedure

Scaled scores for the 12 ITPA subtests were correlated and a principal components factor analytic procedure was performed, followed by a varimax rotations of five factors.

Results

The five factors extracted (Table B-2) were identified as:

Factor I: General Auditory Language
Factor II: Visual Language
Factor III: Expressive Language
Factor IV: General Language/Closure
Factor V: Memory/Expressive Language

Some support was found for the channel dimension, and the expressive process was clearly identified. Other factors did not fit the ITPA model.

Comments

It is doubtful that the five factors found in this study represent stable dimensions, since no criterion for deciding on the number of factors to be retained has been stated, and it seems unlikely that five principal components with Eigenvalues greater than unity would be obtained with only 12 variables.

TABLE B-2

Rotated Principal Components

VARIABLES	FACTORS				
	I	II	III	IV	V
Auditory Reception	.64				
Auditory Association	.53			.31	.29
Verbal Expression			.34	.34	.39
Visual Reception				.38	
Visual Association		.32			
Manual Expression		.51	.47		
Auditory Memory	.41				.40
Grammatic Closure	.68			.29	
Visual Memory					.47
Visual Closure		.62			
Auditory Closure				.52	
Sound Blending	.48	.35		.41	

Cohen, A. Smallest space analysis of the revised Illinois Test of Psycholinguistic Abilities. Psychology in the Schools, 1973, 10, 107-110.

Purpose

This study attempted to establish the construct validity of the ITPA using a non-metric smallest space analysis procedure developed by Guttman and Lingoes.

Subjects

The subjects were 568 first grade children who were graduates of summer Head Start programs as described by Cicirelli et al (1971).

Procedure

The correlation matrix given by Cicirelli et al (1971) for the 10 major subtests of the ITPA was used as input to the Guttman-Lingoes SSA-1 program.

Results

A reasonably good fit was obtained in two dimensions. Cohen concluded that the communication channel dimension and the process level dimension were supported by the results of this analysis. However, the third dimension level of organization was not revealed.

Comments

This study is significant since it is the first reported use of a non-metric scaling procedure to establish the construct validity of the ITPA. Considering that the ITPA was conceptualized according to a three-dimensional model, it seems unfortunate that Cohen did not report how well the data could be represented in three dimensions. See the report by Elkins for a similar analysis.

Elkins, J. A Guttman-Lingoes non-metric representation of the subtests of the revised ITPA. Unpublished manuscript, University of Queensland, 1973.

Purpose

This study was designed to investigate the construct validity of the ITPA in a maneuver other than by factor analysis as suggested by Paraskevopoulos and Kirk (1969).

Subjects

Data used was obtained from the standardization sample as reported by Paraskevopoulos and Kirk.

Procedure

Median values across age groups were obtained for the correlations among the twelve ITPA subtests (Paraskevopoulos and Kirk, 1969, 186). The correlation matrix was used as input for the Guttman-Lingoes SSA-1 non-metric Smallest Space Analysis procedure.

Results

Examination of the representation of the ITPA subtests in 2, 3, and 4 dimensions indicated that the best fit was obtained for the three dimensional representation. A pictorial representation of the relationships among the subtests presented in the study demonstrated:

1. Clear separation of auditory and visual channels.

2. Auditory Association and Grammatic Closure placed very close to each other, lending further support to the idea that Grammatic Closure may be a more representational level than an automatic level subtest.

3. Automatic level subtests (apart from Visual Closure and Grammatic Closure) occupy a common region.

4. Manual Expression and Auditory Expression are in close proximity and the association subtests are in neighboring regions.

5. Visual Sequential Memory is well separated from most other subtests and especially from Auditory Sequential Memory.

Elkins, J.

Comments (Continued)

This study and that by Cohen are the only attempts to examine the construct validity of the ITPA using non-metric scaling procedures. The present study may be criticized in that the use of median correlations may be less desirable than separate analyses for different age groups.

Both studies suggest that the Guttman-Lingoes Smallest Space Analysis procedure may prove to be a valuable approach to the construct validity question.

Elkins, J. The use of the revised ITPA with some Queensland children. Australian Psychology, 1974, 9, 71-77.

Purpose

This study reports on the stability of the American norms for Australian children in the primary grades.

Subjects

Thirty-seven children in grade one, fifty-three children in grade two, and one hundred forty-four children in grade three were selected as average children on the basis of tests and school performance.

Procedure

Distribution statistics were computed for the subtests and for composite scaled scores, mean scaled scores and psycholinguistic ages. The normalcy of the distribution was tested by the Kolmogorov-Smirnov non-parametric test. Skewness and kurtosis were also tested for departure from normalcy.

Results

In grades one and two all subtests and global scores were normally distributed. In grade three only the Sound Blending Test was not normally distributed. In each grade the 10 major subtests had means which were close to the normative value of 36. Verbal Expression, Grammatic Closure, and Auditory Sequential Memory tended to be approximately three scaled scores above the American norms.

The author concluded that the scaled scores obtained from the American norms are approximate for Australian children, except for the supplementary tests of Auditory Closure and Sound Blending.

Comments

The results of this study as well as others from English speaking countries indicate that with caution the American norms can be used in Australia, England and New Zealand.

Guest, K. E. Relationships among the ITPA, receptive and expressive language tasks, intelligence and achievement. Unpublished doctoral dissertation, University of Wisconsin, 1970.

Purpose

This study examined the relationships among the ITPA, selected expressive and receptive criterion language tasks, intelligence, and school achievement for the purpose of finding duplication and overlap in measurement instruments of language and of intelligence.

Subjects

Forty-seven kindergarten Caucasian children (29 boys and 18 girls) from the public schools of Sauk-Prarie, Wisconsin, a semi-rural community, constituted the sample.

Procedure

The subjects were given the revised ITPA and the Wechsler Pre-school and Primary Scale of Intelligence (WPPSI) during their kindergarten school year. During their first grade school year, the subjects were evaluated on Criterion Communicative Effectiveness tasks which included both expressive and receptive language tasks with each of four persons (another child, mother, teacher, and examiner). This battery of tasks was a combination of tasks used by linguists and psycholinguists in previous language studies plus some tasks created by the investigator. The Stanford Achievement Test, Primary I, was administered at the end of first grade.

Data were subjected to correlational analysis and multiple regression analysis.

Results

1. Total IPTA score was significantly related to WPPSI Verbal IQ (.69), to Performance IQ (.47), and to Full Scale IQ (.67).

2. Total Communicative Effectiveness Score (CES), which was a combination of a Receptive Language Score (RLS) and Expressive Language Score (ELS), also related significantly to WPPSI Verbal IQ (.64), to Performance IQ (.44), and to Full Scale IQ (.63).

3. Total ITPA score was significantly related to total CES (.61), but there was no real relationship between ELS and the expressive subtests of the ITPA (.28) and only a moderate relationship between RLS and receptive subtests of the ITPA (.43).

Guest, K. E.

Results (Cont'd).

4. Intelligence, total ITPA score, and total CES score were all significantly related to school achievement as follows:

Total ITPA and Total Achievement	.47
WPPSI Full Scale IQ and Total Achievement	.73
Total CES and Total Achievement	.52

5. Auditory Association (.48), followed by Grammatic Closure (.36) and Auditory Memory (.36), were the best predictors of total achievement.

6. Of the ITPA subtests, Auditory Association (.58), Auditory Reception (.50), and Grammatic Closure (.46) correlated most highly with WPPSI Full Scale IQ.

7. The Grammatic Closure subtest correlated as highly with CES (.63) as did total ITPA score (.61), Auditory Association correlated second highest with CES (.61).

Comments

Correlations between ITPA and WPPSI scores were not as high as those in Huizinga's study correlating ITPA and WISC but were higher than the Polley study correlating ITPA and WISC. Visual Sequential Memory, which showed high correlations with reading in previous studies, showed a relatively low relationship to reading in this study.

Hare, B. A., Hammill, D., and Bartel, N. R. Construct validity of selected subtests of the ITPA. Exceptional Children, 1973, 40, 13-21.

Purpose

This study was designed to investigate: a) whether the ITPA subtests are identifiable as separate traits; b) whether they are consistent with the Osgood model of communication.

Subjects

Subjects were 126 third grade children who attended eight classes in four different communities. All subjects came from English speaking families in middle class communities. The boy/girl ratio was 1:1, and 7% of the subjects were black. The mean CA was 103 months (range 95-112). Only children who were achieving at a rate and level considered normal by their teachers were included.

Procedure

The subjects were administered six ITPA subtests (Auditory Reception, Visual Reception, Verbal and Manual Expression, Auditory and Visual Sequential Memory). A parallel task was designed to correspond with each of the selected subtests. The matched task differed from the corresponding subtest in only one dimension while it was identical or equivalent in the other aspects. (In one instance the level of organization, content, and process might be held constant while the input or output modality (channel) was changed). A vocabulary test adapted from Ammons and Ammons was presented in both auditory and visual forms. In all 16 tests were administered (6 subtests and 10 parallel tasks or reference tests).

Results

Seven factors with eigenvalues of 1.0 or greater emerged from the principal component analysis accounting for 60 percent of the variance.

1. Factor I: Graphic Language accounted for 20 percent of the total variance. All of the tests loading highly on this factor involve reading or writing. None of the ITPA subtests loaded on this factor.

2. Factor II: Oral Language Comprehension, accounted for 12 percent of the variance. All tests loading highly on this factor are representational, receptive and auditory, and reflect the ability to understand the meaning of spoken language.

Results (Cont'd).

3. Factor III: Oral Language Usage accounted for 9 percent of the variance. The two tests which loaded on this factor are representational involving verbal expression. Age loaded highly on this factor. The tests involve the ability to make verbal inferences about objects and pictures of familiar situations.

4. Factor IV: Visual Sequential Memory, accounting for 7 percent of the total variance, is comprised solely of the ITPA Visual Sequential Memory subtest.

5. Factor V: Auditory Sequential Memory, is comprised of the ITPA Auditory Sequential Memory subtest, and nonsense syllable repetition and accounted for 7 percent of the total variance.

6. Factor VI: Visual Reception, has loadings by the ITPA Visual Reception subtest and sex. Boys needed to possess this trait more than girls. This factor accounted for 6 percent of the variance.

7. Factor VII, expression of function, accounted for 5 percent of the total variance. Both forms of the ITPA Manual Expression subtest loaded on this factor.

8. The validity of the subtests is supported to the extent that they cluster with other tests which are compatible in terms of the Osgood-Kirk model.

9. The coding of 5 or 6 subtests matched that of its factor. (Manual Expression did not). Since the Osgood model itself does not account for modality differences, the factor is consistent with that model.

Comments

The findings of this study generally support the construct validity of the ITPA. It would have been preferable for a true factor-analytic procedure to have been used, thus analyzing the common variance, and for the effect of age to be partialled out statistically. It is not clear whether raw scores or scaled scores were used. Also, the criterion of selecting factor loadings above .50 is unusually high, and not justified in the text. On Factor II, a loading of .45 by Visual Reception, and another of -.68 by visual digit span make the interpretation of this factor as oral language comprehension rather tenuous.

Newcomer, P., Hare, B., Hammill, D., and McGettigan, J.
Construct validity of the ITPA. Exceptional Children, 1974, 40, 509-510.

Purpose

The ITPA was factor analyzed with matched criterion variables to determine construct validity, i.e., the extent to which each subtest represents underlying Osgoodian theory and measures a discrete combination of the psycholinguistic dimensions of level, process, and channel.

Subjects

The subjects were 167 public school children who were similar to the standardization sample of the revised ITPA, and who ranged in age from 105 to 118 months and whose intelligence was within normal range on standardized tests.

Procedure

All children were administered the ITPA plus 20 external criterion tests. Two types of criterion tests were provided for each ITPA subtest: (a) tests which met each specification of the Osgood model but differed in content and (b) tests in which content and the psycholinguistic dimensions of level and process were held constant while the channel was varied.

Results

With the exception of Visual Sequential Memory, Visual Reception, and Auditory Reception, the ITPA subtests appeared to measure discrete independent abilities. Although eight subtests do not necessarily tap all three psycholinguistic dimensions, there was considerable support found for two of the three constructs upon which the ITPA is based, i.e., level and process.

Comments

The channel concept had the least empirical substantiation. Except for the visual closure subtest, the authors concluded that the visual modality as measured by the ITPA is completely without substantiation. This study is one of the few that use external criterion tests. Unfortunately, it was done with older children at the top of the test norms where many of them reach the ceiling of the tests. Such a study should be conducted with younger children. The same comments can be made for this study as were made for the study by Hare, Hammill and Bartel.

Hatch, E., and French, J. The revised ITPA: its reliability and validity for use with educable mentally retarded. Journal of School Psychology, 1971, 9, 16-23.

Purpose

This study examined the reliability and validity of the ITPA through serial testing. In addition, six criterion instruments were also administered to explore concurrent validity.

Subjects

Twenty-one students, 13 boys and 8 girls, ranging in IQ from 45 to 84 and in age from seven to twelve served as subjects in this research.

Procedure

Each subject was administered the revised ITPA twice, with a three month interval between testings. Criterion testing followed the administration of the ITPA for the purpose of assessing validity. These criterion tests included the Vocabulary and Picture Completion subtests of the WISC, the Figure-Ground subtest of the Frostig Development Test of Visual Perception, the Harris-Goodenough Draw-a-Person, and the Raven's Coloured Progressive Matrices. In addition, the Quay-Peterson Behavior Problem Checklist was completed by teachers and a principal. Pearson Product Moment correlation coefficients were computed for every pair of input variables, and t-tests for significant differences were calculated where applicable.

Results

The reliability coefficient for the test-retest total score was .97. The behavior Problem Checklist did not correlate significantly with any of the ITPA subtests. The Wechsler Vocabulary test correlated at the .05 level of significance or better with every subtest except Sound Blending.

A coefficient of .42 was found between Manual Expression and the Draw-a-Person test. The highest correlation (r=.88) for the Draw-a-Person was with Visual Closure.

The correlation of the Coloured Matrices with Visual Association was .76 and with Auditory Association it was .81.

The correlation of Figure-Ground with Visual Closure was .70 and with Visual Association it was .75.

Hatch, E., and French, J.

Comments

The result of this investigation concerning the stability of the ITPA generally agree closely with the data provided by Paraskevopoulos and Kirk (1969). The test-retest correlations in this study, however, are higher possibly due to (a)a three month test-retest period, instead of five, and (b)a restricted range of average children versus a more heterogeneous group of mentally retarded children. The sample size is of course too small to draw conclusive inferences.

Huizinga, R. J. The relationship of the Illinois Test of Psycholinguistic Abilities to the Stanford-Binet L-M and the Wechsler Intelligence Scale for Children. Unpublished doctoral dissertation, University of Arizona, 1971. Also in Journal of Learning Disabilities, 1973, 6, 451-456.

Purpose

This study examined the concurrent validity of the revised edition of the ITPA by determining the relationship of ITPA measures to the Stanford-Binet scores and to the WISC scores.

Subjects

One hundred six-year-olds (50 boys and 50 girls) from a public school district of Tucson, Arizona, served as subjects. The school district was characterized as lower-middle to middle socio-economic class, predominantly Caucasian with approximately 10 percent Mexican-American representation.

Procedure

Three certified school diagnosticians administered to each of the subjects the revised ITPA, the Stanford-Binet Form L-M, and the WISC in a counter-balanced order of presentation. A correlational analysis of the results was made.

Results

1. The table below presents the correlations among the scores on the ITPA, Stanford-Binet, and WISC.

Correlations of the global measures of the ITPA, the Stanford-Binet Form L-M, and the WISC

	Stanford-Binet		WISC		
	MA	IQ	VS	PS	FS
ITPA					
Composite PLA	.89				
Total Scaled Score		.88	.75	.58	.80
Ratio PLQ		.90	.76	.55	.80
Estimated Binet MA	.90				
Stanford-Binet Form L-M					
IQ			.80	.57	.84

Results (Continued)

2. Auditory Association is the ITPA subtest which best correlated with the Stanford-Binet IQ (.71), the WISC verbal IQ (.70), and the WISC full scale IQ (.62). The ITPA subtests which correlate highest with the WISC performance IQ are Visual Reception (.45) and Visual Association (.45).

3. The Standard error of estimating the Stanford-Binet IQ from the ITPA Ratio IQ is 5.61 IQ points; the standard error of estimating the WISC full scale IQ from the ITPA Ratio IQ is 6.68 IQ points.

4. Intercorrelations of subtest scores of the WISC and the ITPA are available in the dissertation.

Comments

This study applies only to six-year old children and should not be generalized to other age groups. See the studies by Guest and Polley.

Newman, G. A. E. The Illinois Test of Psycholinguistic Abilities: Grammatic Closure subtest: A validity study. Unpublished masters thesis, University of Texas at Austin, 1972.

Purpose

To establish the concurrent validity of the Grammatic Closure subtest using the expressive section of the Northwestern Syntax Screening test (NSST) as the criterion test.

Projects

Forty normally developed children in kindergarten selected on the same criteria as the standardization population of the ITPA.

Procedure

The children were administered the PPVT, the Grammatic Closure Test and the Northwestern Syntax Screening Test. One-half of the group was administered the NSSCT first, and the other half the ITPA subtest first.

Results

The Grammatic Closure Test correlated .65 with the expressive section of the NSST. Thus, 42 percent of the variance of the ITPA subtest performance is associated with the variance in the MSST expressive performance. The correlation between the ITPA subtest and the Receptive Section of the NSST was .11, and between the total NSST and the ITPA subtest .39.

Comments

The Grammatical Closure Test appears to be a test that correlates with many tests, and is one of the tests that correlates with reading in the upper primary grades. It also correlates highly with other auditory vocal linguistic tests in the ITPA.

Paletz, D. and Hirshoren, A. A comparison of two tests of visual sequential ability. Journal of Learning Disabilities, 1972, 5, 102-103.

Purpose

This study compared the revised ITPA Visual Sequential Memory Subtest and the Knox Cube Test to determine if they measure the same memory ability.

Subjects

The subjects for this study were 96 elementary school children from Urbana, Illinois. The population from which these children were drawn and the age ranges represented were similar to those of the 1968 ITPA standardization sample.

Procedure

The ITPA subtest and the Knox Cube Test were given to four groups of 24 children each (12 boys and 12 girls) in kindergarten, second, fourth, and sixth grades. The administration of the two tests was counterbalanced in each grade level sample. Correlations between the two test scores were run separately for each group.

Results

The correlations between the two tests were as follows:

for kindergarten children	.57
for second grade children	.17
for fourth grade children	.08
for sixth grade children	.22

The authors conclude that the low value of the above correlations seems to indicate that the two measures do tap different abilities.

Comments

A similar study was conducted by Stark (1967) comparing the Knox Cube Test, the experimental ITPA Visual-Motor Sequencing subtest, and the experimental ITPA Auditory-Vocal Sequencing subtest with aphasic children with a mean CA of 6-6. The correlation between the Knox Cube Test and the Visual-Motor Sequencing subtest was .41. Comparing these results and the present study, it may be that these two tests are related only for young children. However, since the number of subjects within each grade level was only 24, the correlations observed will have wide confidence intervals and it is difficult to draw inferences safely. Also, the grade four and grade six children will have been mostly above the age appropriate for the ITPA and a ceiling effect would also depress the correlations.

Perozzi, J. A. The relationship between speech sound discrimination skills and language abilities of kindergarten children. Unpublished doctoral dissertation, University of Washington, 1969.

Purpose

To investigate the relationship between speech sounds discrimination skills and language abilities as defined by the ITPA.

Subjects

30 children (16 females and 14 males) between the ages of 5-3 and 6-5 (mean age 5-10) served as participants in this study.

Procedure

The SSD tests contained 40 minimal word pairs selected from Templin's (1957) Picture Test. One word from each pair was randomly chosen and paired with itself giving an 80 item test. Contrasting sound elements in each "different" pair of words were joined with an adjacent sound to form pairs of "different" syllables. The words in the "same" pairs, were reduced to syllables by eliminating initial or final consonants from a pair. Responses were given by pointing to a large S or D.

The ITPA was administered as a measure of language ability.

Results

1. Significant correlations ($p < .01$) were obtained between the SSD tests and these ITPA subtests: Verbal and Manual Expression and Visual Association; and between the 2 SSD tests and the ITPA total (Table B-5).

2. An intercorrelation matrix among Auditory Sequential Memory, Auditory Closure, Sound Blending and the SSD tests indicated a low relationship among them. Only the correlation between Auditory Sequential Memory and Sound Blending was significant ($p < .05$).

3. The correlation between the two SSD tests was .873 ($p < .01$), indicating the two tests measure the same skill.

Perozzi, J. A.

Significant Correlations Between ITPA and SSD Tests

ITPA Subtest	SSD Tests	
	Word	Syllable
Verbal Association	.50**	.54**
Verbal Expression	.51**	.47**
Grammatic Closure	.38*	.37*
Manual Expression	.53**	.55**
ITPA Total	.66**	.63**

*p .05 **p .01

Comments

Although the author emphasizes the support given to the idea that SSD and language production are closely linked, rather than the view that SSD is a receptive skill, the study poses more questions than it answers. The relationship of SSD to Visual Association and Manual Expression is difficult to explain. One must question whether the SSD tests are appropriate for 5 year old children, especially since the notion of same-different is a necessary part of test performance.

Polley, D. The relationship of the channels of communication of the ITPA and the WISC. Unpublished doctoral dissertation, University of Northern Colorado, 1971.

Purpose

This study sought to determine the degree of relationship between the ITPA scores and the verbal and performance scales of the WISC.

Subjects

The 160 subjects, grades one through three, were selected from those students referred to Special Services of Adams County (Colorado) Public Schools because of suspected or indicated learning disability. Mean CA was 8-0 with a range from 6-1 to 10-1. Race, creed, sex, and intelligence were disregarded in sample selection.

Procedure

All subjects were given the ITPA and the WISC within a two week period. Inter-correlations were calculated for all subtests and for part and total scores of each test. Group means and standard deviations were calculated to compare subjects of this study to the normative populations of the two tests.

Results

The following correlations were derived:

Sum of ITPA scaled scores and WISC full scale IQ	.49
Auditory-Vocal channel of ITPA and WISC verbal IQ	.28
Visual-Motor channel of ITPA and WISC performance IQ	.20
WISC Verbal IQ and WISC performance IQ	.65
ITPA Auditory-Vocal channel and ITPA Visual-Motor channel scores	.72

Comments

The low correlations between the WISC and ITPA scores found in this study is at variance with the results of Huizinga and of Guest. The only explanation for these low correlations might be surmized by the fact that the subjects of this study had a mean CA of 8-0 and a range of 6-1 to 10-1. Since a substantial proportion of the subjects must have scored at the top of the standardization norms, it is very likely that this fact could possibly produce a low correlation. In addition, this group of learning disability children could constitute a restricted range of abilities, hence tending to depress the correlations.

Proger, B. B., Mann L., Bayuk, Jr., R. J., Burger, R. M., Cross, L. H., and Green, P. A. Factorial structure of the Illinois Test of Psycholinguistic Abilities. Psychological Reports, 1973, 32, 931-935.

Purpose

This study was designed to explore the factor structure of the ITPA with emotionally disturbed boys.

Subjects

Ninety-five emotionally disturbed boys were selected with equal numbers from Aggressive, Hyperactive and Withdrawn categories. Chronological age ranged from 8 years to 14 years with a mean of 10 years 1 month.

Procedure

All subjects were given the revised ITPA and the WISC. A principal components factor analysis was performed, followed by a varimax rotation of the five components with eigenvalues greater than unity.

Results

Factor I was defined by the five verbal scale subtests of the WISC, Auditory Association and Grammatic Closure. This supports the construct validity of the Auditory Association subtest and confirms findings that place Grammatic Closure at the representational level. Factor II had significant loadings on Digit Span, Block Design and Auditory Sequential Memory. While this is consistent with the integrative level, it should be noted that Visual Sequential Memory did not load on this factor. No ITPA subtests loaded on Factor III which was defined by Object Assembly and Coding. Factor IV comprised Visual Sequential Memory, both ITPA expression subtests with Picture Completion and Picture Arrangement from the WISC. Factor V was defined by five ITPA subtests: Visual Association, Grammatic Closure, Visual Closure, Auditory Reception and Visual Reception.

Comments

The authors claim that those subjects who were older than the upper limits of the ITPA standardization sample did not move above the norms of the test. However, it would have been useful to have presented distributional information for this sample. Since the WISC is another complete battery, rather than a set of measures selected as reference tests for the ITPA subtests, this study is somewhat limited in its aim of establishing the construct validity of the ITPA. It may have been useful to examine the relationship between the ITPA and the WISC as batteries, using canonical correlation.

Smith, P. A., and Marx, R. W. The factor structure of the revised edition of the Illinois Test of Psycholinguistic Abilities. Psychology in the Schools, 1971, 8, 349-356.

Purpose

This study compared the factorial composition of the revised ITPA with its predecessor.

Subjects

The subjects for the research consisted of 43 elementary school children with an age range of 5-7 to 10-10 and an IQ range from 70 to 138.

Procedure

The ITPA was administered to all the children and scaled scores were used. In addition, a WISC IQ was obtained to assess the relative contribution of this component in the various ITPA dimensions. The WISC IQ and all 12 subtests of the revised ITPA were intercorrelated and factor analyzed by means of a principal component analysis with maximum raw values as estimates of commonality. The resulting factor matrix was rotated to a varimax solution.

Results

Results indicated that all subtests correlated with IQ at the .01 level of significance except for Sound Blending, which correlated at the .05 level. Correlation between full-scale WISC IQ and Psycholinguistic Age was .63. Four factors extracted 54 percent of the total variance. These factors were (I) general linguistic ability, (II) rote auditory memory, (III) mediated memory, and (IV) representational expression. A large general factor that appeared to tap general linguistic ability accounted for 42 percent of the common variance, and factors II, III, and IV accounted for 14 percent, 23 percent, and 21 percent respectively. IQ loaded substantially on all four factors, but most heavily on Factor I.

Comments

This study suffers from the same criticism given other factor analytic studies; namely, the lack of use of criterion tests.

SECTION C

SCREENING, PREDICTION AND DIAGNOSTIC STUDIES

Crittenden, J. B. An empirical investigation of the behavioral dimensions of four tests of learning disabilities. Unpublished doctoral dissertation, Michigan State University, 1969.

Purpose

The purpose of this study was to identify the dimensions which underlie four tests used for diagnosis and remediation of learning disabilities for the purpose of reducing the diagnostic process.

Subjects

Subjects were 305 disadvantaged kindergarten children.

Procedure

All subjects were given the revised edition of the ITPA, the Frostig Developmental Test of Visual Perception, the Wepman Auditory Discrimination Test, and the Purdue Perceptual Motor Survey. Data were submitted to Principal Axis Factor Analysis with Varimax Rotation. Two-way analysis of variance and multiple regression analyses were also run. The Framework for hypothesizing the factor structure came from Guilford's Structure of Intellect model and his Matrix of Psychomotor Abilities.

Results

1. The factorial nature of the revised ITPA was best represented by three dimensions described by Guilford and related to individual subtests as follows:

Visual Reception - Cognition of semantic relations
Verbal Expression - Convergent production of semantic relations
Auditory Sequential Memory - Memory for symbolic systems

2. The four subtests which appeared to best predict IQ were Auditory Association, Auditory Sequential Memory, Grammatic Closure, and Spatial Relations (Frostig).

Comments

Reference should also be made to the Feldman study herein abstracted.

Feldman, B. Prediction of first grade reading achievement from selected structure of intellect factors. Unpublished doctoral dissertation, University of Southern California, 1969.

Purpose

This study was concerned with testing the criterion validity of Guilford's Structure of Intellect by predicting first grade reading achievement from identified SOI factors.

Subjects

Subjects were 196 first graders from a California school system.

Procedure

Subjects were given, in the fall of the school year, a battery of 21 tests, including three revised ITPA subtests, which were submitted to a factor analysis to select predictive SOI factors. The following spring the subjects were given reading tests, and a stepwise multiple regression was run.

Results

1. Memory of Figural Units (Visual) and Memory of Figural Units (Auditory) proved to be the best predictors of reading, followed by Evaluation of Figural Units (Auditory), then Cognition of Semantic Units, and then Cognition of Figural Units (Auditory).

2. Correlations between the three ITPA subtests administered and the SOI factors were as follows:

Auditory Closure and Cognition of Figural Units (Auditory)	.43
Auditory Closure and Evaluation of Figural Units (Auditory)	.42
Sound Blending and Cognition of Figural Units (Auditory)	.58
Auditory Sequential Memory and Memory of Figural Units (Auditory)	.83

Comments

The correlations between the SOI factors and the ITPA subtests are not surprising since they are dealing with similar functions. Reference should also be made to the Crittenden study herein abstracted.

Fiester, A., and Giambra, L. M. Language indices of vocational success in mentally retarded adults. American Journal of Mental Deficiency, 1972, 77, 332-337.

Purpose

The purpose of this study was to investigate the use of language and communication skills in prediction of vocational success in sheltered workshops in the greater Chicago area. The subjects were ages 18 to 30, with IQ's in the range of 40-70. The success sample contained those persons with a productivity greater than 25% of the minimum wage for a period of at least 7 months. All subjects were screened to exclude hearing impairment and gross physical handicaps.

Procedure

Subjects were administered tests within three major areas: Receptive Language, Expressive Language, and Short Term Memory. The tests included subtests of the ITPA, the Peabody Picture Vocabulary Test, the Northwestern-Syntax Screening Test, the Developmental Sentence Scoring Technique, the Detroit Test of Learning Aptitude and the Sentence Subtest from the Wechsler Pre-school Primary Scale of Intelligence. The successful and failing groups were compared on 21 variables using "t" tests.

Results

Nine variables discriminated significantly among the success and failing groups. Only four of these (including Verbal Expression, Manual Expression, Auditory Sequential Memory) correlated significantly with productivity. A multiple regression equation using these variables was obtained, indicating 75% success rate as predicting occupational success.

Comments

Although no information was presented to determine the appropriateness of the ITPA to mentally retarded Ss, the study does appear to have located some potentially useful predictors of productivity in a sheltered workshop setting. However, a cross-validation study would add greatly to the value of this report.

Humphrey, J., and Rice, A. An evaluation of several methods of predicting full scale IQ from the ITPA. The Journal of Special Education, 1973, 7, 133-140.

Purpose

The purpose of this study was to explore the feasibility of using the ITPA to indicate a child's intellectual status.

Subjects

The sample consisted of 138 children, with a mean age of 7-6 ranging from 4 to 10 years. The children were selected without regard for age, sex, or ethnic membership. The normative subgroup consisted of 74 subjects (IQ 85 to 115) and the low subgroup included 46 children with IQ 50 to 84.

Procedure

The ITPA and WISC were administered to all children except the 26 who received the WPPSI. After all tests had been administered, three estimates of IQ based on the results of the ITPA were determined. The first estimate was from the manual, based on correlation with Binet IQ in the standardization sample. The second estimate was the $PLQ = \frac{PLA}{CA} \times 100$, and the third was a transformation of the Composite Scaled Score to a mean of 100 and S.D. of 15. Four IQ's (Wechsler FSIQ and the three ITPA estimates) were compared for the entire groups and for the two subgroups.

Results

1. The test of equality among the four IQs was significant ($p < .05$). The estimate of S-B IQ and CSS—derived IQ did not differ from the FSIQ, but FSIQ and PLQ differed, PLQ giving a lower IQ estimate.

2. Correlations of .88, .88 and .87 were found between the FSIQ and the estimate of S-B IQ, SS-derived IQ, and PLQ, respectively. Correlations among the three ITPA estimates were .97 or higher.

3. Concerning the normative subgroup, the analysis of variance yielded a significant difference between the FSIQ and the SS-derived IQ estimate, and between the FSIQ and the PLQ ($p < .05$).

In the low - IQ subgroup, the analysis of variance yielded a significant difference at the .05 level between FSIQ and SS-derived IQ.

Humphrey, J. and Rice, A.

Comments

It is not surprising that three methods of estimating IQ from the same raw data (the sum of raw scores on the 10 ITPA subtest) agree so closely. The study provided valuable cross-validation of the estimated Binet IQ table provided in Paraskevopoulos and Kirk, especially beyond the restricted ability range of the standardization sample.

Kiniry, S. Differentiating elementary children with learning disabilities using the Illinois Test of Psycholinguistic Abilities. Unpublished doctoral dissertation, East Texas State University, 1972.

Purpose

This study was designed to determine whether the ITPA discriminated between learning disabled and normal children, and to investigate relationships between the ITPA and the Gates-McKillop Reading Diagnostic Tests.

Subjects

Thirty control children were matched in age, sex, and IQ to thirty learning disabled children. The mean CA for each group was 8 years 9 months (range from 6 to 10 years), while the mean IQ was 107.

Procedure

All children were tested on the ITPA and the Gates-McKillop RDT. The learning disabled and regular groups were compared on these tests using univariate "t" tests. Correlations between ITPA subtests and Gates-McKillop subtests were obtained.

Results

The learning disability group performed less well than the control group on Verbal Expression and Auditory Memory ($p<.01$), and Visual Sequential Memory and Sound Blending ($p<.05$). Significant differences were also found for both channels of communication ($p<.05$) and for the automatic level ($p<.01$). For the learning disability group, significant correlations among the ITPA and Gates-McKillop subtests were .56 between Visual Closure and Recognizing the Visual Form of Words, .41 between Visual Sequential Memory and Auditory Blending, and .37 between Auditory Closure and Auditory Blending. For the regular learners, Auditory Sequential Memory showed correlations from .43 to .65 with all Gates-McKillop subtests, while Auditory Association correlated significantly with four subtests of the Gates-McKillop, and Sound Blending correlated .44 with Auditory Blending.

As a check on the extent of reading problems, the learning disability and regular groups were compared and significant differences ($p<.01$) were found for all Gates-McKillop subtests.

Kiniry, S.

Comments

The analysis of this study leaves much to be desired, being yet another status study in which the correlations among the subtests are ignored when subtests differences are examined. It would have been preferable to use a multivariate analysis of variance to examine overall group differences. The wide CA range, including children up to 10 years, suggests that the results need to be interpreted conservatively, since the difference among 6 year olds may not be the same as the differences among 10 year olds.

Newcomer, P., and Hammill, D. A short form of the revised Illinois Test of Psycholinguistic Abilities. Journal of Learning Disabilities, 1974, 7, 46-48.

Purpose

This study attempted to develop a short form for the ITPA for use in research projects.

Subjects

Subjects were 83 normal children between the ages of five and ten who were randomly selected from regular classes in various schools in the greater Philadelphia area.

Procedure

Item sampling was selected for use with the ITPA as it taps all the functions measured by the original instrument and insures the shortened form's reliability and validity as a clinical tool as well as an instrument for research. Forty-five subjects were initially administered the entire 1968 edition of the ITPA. Five days later they took the abbreviated version of the test. The remaining 38 subjects were administered the shorter version first, followed by the full test five days later. The equivalency of the two forms of the tests was determined by the following statistical treatment: First, the mean and standard deviation of each subtest on the two forms were computed. Second, the significance of the mean difference was evaluated using the "t" test for correlated means. Finally, the relationship of the two forms was studied using the Pearson product moment correlative procedure.

Results

Results of the "t" tests indicated that differences between the subtest mean scores on both versions of the test were not statistically significant at the 5% level of confidence. All subtests but Auditory Closure (.78) met Guilford's criterion relative to correlation coefficients which suggests a lower limit of .80 for acceptable alternate test reliability.

Comments

The high positive correlations obtained between the short form and the long form are probably due to the fact that the authors failed to partial out age. This is a scientific necessity when raw scores are used.

Smith, J. M. Utilization of the Illinois Test of Psycholinguistic Abilities with educationally handicapped children. Unpublished doctoral dissertation, University of the Pacific, 1970.

Purpose

This study attempted to determine the value of the revised ITPA in identification, diagnosis, placement, and program development for children with educational handicaps. Three specific questions were asked: (1) Do EH children have learning modality deficiencies as measured by the ITPA when compared with the children from the normative population? (2) Are there differences in the learning modality abilities of EH students related to sex? (3) Do highly verbal EH boys differ in their profiles from those who were performance skilled?

Subjects

Subjects were 74 children with normal intelligence enrolled in the program for the Educationally Handicapped in the San Juan Unified School District, Carmichael, California, who exhibited a significant discrepancy between ability and achievement. These children ranged in CA from 7-3 to 10-3 and exhibited no identified sensory handicaps such as severe hearing, speech, sight, or physical disabilities. Mean group IQ was 96.7. These children were performing in school a minimum of two years below their ability level.

Procedure

All subjects were given the ITPA; WISC scores were available for the boys. Statistical analysis was by means of "t" tests.

Results

1. The performance of the EH subjects was significantly poorer than the normative population ($<.05$) on the following subtests: Auditory Closure, Auditory Reception, Verbal Expression, Grammatic Closure, Visual Memory, Visual Association, Visual Closure, and Auditory Association. These deficiencies among the EH students are not confined to either the representational or the automatic level.

2. On Sound Blending subtest, the EH subjects signficantly outperformed the normative population with a mean scaled score of 40.4.

3. There were no differences noted between the girls' and the boys' performance on the ITPA.

Smith, J. M.

Results (Cont'd)

4. Verbally-skilled boys (defined as the WISC verbal IQ score exceeding the performance IQ score by 15 points) scored significantly higher on Grammatic Closure ($p<.02$), Auditory Closure ($p<.05$), and Sound Blending ($p<.01$) than the performance-skilled boys (defined as the WISC performance IQ being 15 points higher than the verbal IQ score); the latter scored significantly higher on Visual Closure ($p<.02$).

Comments

The subjects in this study were children at the nine year level who typically score at the top of the norms, thus restricting the standard deviation of the group data. It would have been more enlightening if younger children had been used in this type of study.

The superiority of the EH group on Sound Blending may not have emerged if a concurrent control group had been used. It appears that changes in the teaching of reading since the standardization of the revised ITPA may have resulted in generally higher performance on the Sound Blending subtest.

Wallace, L. Prediction of Jensen's levels of learning through use of the Illinois Test of Psycholinguistic Abilities, Unpublished doctoral dissertation, University of Arizona, 1973.

Purpose

The purpose of this study was to investigate the relationship of Level I and Level II intelligence as conceptualized by Arthur R. Jensen to the automatic and representational levels of the revised Illinois Test of Psycholinguistic Abilities (ITPA).

Subjects

Fifty subjects ranging in age from six through ten years were selected from a pool of 449 children classified as educable mentally retarded. Their IQ's ranged from 53 through 70.

Procedure

In addition to Stanford-Binet IQ's, scores were obtained for each subject on the ITPA, the Raven's Progressive Matrices, and two of Jensen's Level I tasks: (1) digits for memory, and (2) paired-associates. The Raven's was selected to measure Level II functioning. Correlation coefficients between all 12 subtests of the ITPA and the Level I and Level II tasks for the total sample were obtained. Tests of significance were made to determine which of the correlations differed from .0.

Results

The following are the results of the research:

1. Four of the five ITPA subtests, Visual Sequential Memory, Visual Closure, Sound Blending, and Auditory Closure significantly related to the paired-associates performance were automatic level measures.

2. The ITPA subtests, Auditory Association, Visual Association, and Verbal Expression, which were significantly correlated with the Raven's Progressive Matrices were representational level measures.

3. Auditory Association and Verbal Expression were correlated significantly with the Stanford-Binet IQ.

Comments

This study would have been more useful if it had selected mentally retarded subjects with the same Stanford-Binet IQ from suburban areas and from disadvantaged communities; a differentiation of primary and secondary mental retardation from these different socio-economic areas would have meaning.

SECTION D

CLINICAL, ETHNIC AND/OR SOCIAL CLASS STUDIES

Butts, T. M. A study of race and social class variables and psycholinguistic, cognitive, and perceptual measures of selected first grade children. Unpublished doctoral dissertation, University of Alabama, 1970.

Purpose

This study attempted to determine if significant differences exist between four urban cultural groups (middle class white, lower class white, middle class black, lower class black) on 12 psycholinguistic and three visual perceptual measures.

Subjects

Forty-eight first grade children from six elementary schools in Huntsville, Alabama, were divided into four groups matched on intellectual level, CA, educational status, sex, race, and social class. Range of IQ scores was 84-116 as measured by Slosson Intelligence Test. Socio-economic status was assessed by McGuire White Social Status Index, Short Form.

Procedure

All subjects were individually examined by trained examiners on 12 subtests of the revised ITPA and on 3 areas of the Cross Cultural Study of Perception (CCSP). Two way analysis of variance was used; .05 was selected as the level of significance. Ancillary data were obtained by computing a correlation matrix among all subtests.

Results

A comparison of four groups of 12 subjects each indicated that:
1. middle class whites were significantly superior in Visual Reception, Visual Closure, Auditory Closure, and Auditory Association to middle class blacks, lower class blacks, and lower class whites;
2. in auditory sequential memory the middle class blacks were significantly superior to lower class whites and lower class blacks, and although the mean raw score for MCB's was 34.5 compared to 29.67 for the MCW's, this difference was not statistically significant; (3) middle class whites were significantly superior on visual sequential memory to lower class blacks and to lower class whites, but middle class blacks were also significantly superior to lower class whites.

Comments

The results of this study confirm other studies on class and race differences on the ITPA. The small N of 12 for each group, however, makes the results tentative. All four groups scored above the norms on the Visual Sequential Memory subtest.

Caccamo, J. M. and Yater, A. C. The ITPA and Negro children with Down's Syndrome. Exceptional Children, 1972, 38, 642-643.

Purpose

This study investigated whether the ethnic superiority of Blacks in short-term auditory sequential memory found in other research studies would be observed in exceptional Negro children.

Subjects

The sample consisted of Negro children with Down's Syndrome.

Procedure

The revised ITPA was administered to each subject. A "t" test comparison of means was used to analyze the data for each subtest and for the channels and processes dimensions of the test.

Results

1. No significant difference was found between this sample's performance on the Auditory Sequential Memory subtest and performance on the other subtest.

2. This sample's performance on the Manual Expression subtest was significantly superior to their performance on all other subtests except Visual Closure.

3. Subtest comparison by channel indicated that visual-motor performance was significantly superior for the processes of reception, expression, and closure. The processes of Association and Sequential Memory were not statistically significant but also showed a preference in favor of visual-motor channel.

Comments

These results of no superiority in Auditory Sequential Memory differ from the findings of Ryckman (1966), Bateman (1964), Circirelli (1969), and Westinghouse Learning Corporation (1969). The high performance in Manual Expression of this sample, however, is in harmony with studies of Caucasian children with Down's Syndrome (McCarthy). Apparently, Negro children with Down's Syndrome perform more like Caucasian children with Down's Syndrome than like non-Down's Syndrome Negro children.

Cicirelli, V. G., Granger, R., Schemmel, D., Cooper, W. C., Holthouse, N. Performance of disadvantaged primary-grade children of the revised ITPA. Psychology in the Schools, 1971, 8, 240-246. Data extracted from Westinghouse Learning Corp. and Ohio University, The Impact of Head Start, 1969.

Purpose

This study compares the performance on the ITPA of white, black, and Mexican-American children in grades 1, 2, and 3. The relationship of the ITPA to readiness and school achievement was also explored.

Subjects

Subjects were drawn from a random sample of 75 Head Start centers which offered summer programs during the year 1966 to 1967. The numbers of children selected were: first grade 563; second grade 540; third grade 392. The average chronological age of the children was 6-6 years in grade 1; 7-6 years in grade 2, and 8-6 years in grade 3.

Procedure

All children were administered the ITPA. In addition first grade children were given the Metropolitan Readiness Test, the grade 2 children the Stanford Achievement Test - Battery 1, and the grade 3 children were given the Stanford Achievement Test - Battery 2. Analysis of subtest performance on the ITPA was made for the three ethnic groups at each grade level. The pattern of inter-correlations among the subtests of the ITPA was computed within grades. The ITPA total and subtest scores were also correlated with the Metropolitan Readiness Test and the Stanford Achievement Tests.

Results

1. The total group had generally below average ITPA profiles in Grades 1, 2, and 3.

2. Performance was most depressed at the representational level and in the auditory vocal channel.

3. The profiles for the three ethnic groups were similar, though the whites had the least variability. Variability increases from grade 1 through grade 3.

4. Blacks scored highest and Mexican-Americans lowest on Auditory Sequential Memory, while Mexican-Americans scored highest on Visual Sequential Memory and blacks lowest.

Cicirelli, V. G., Granger, R., Schemmel, D., Cooper, W. C., and Holthouse,N.

Results (Cont'd)

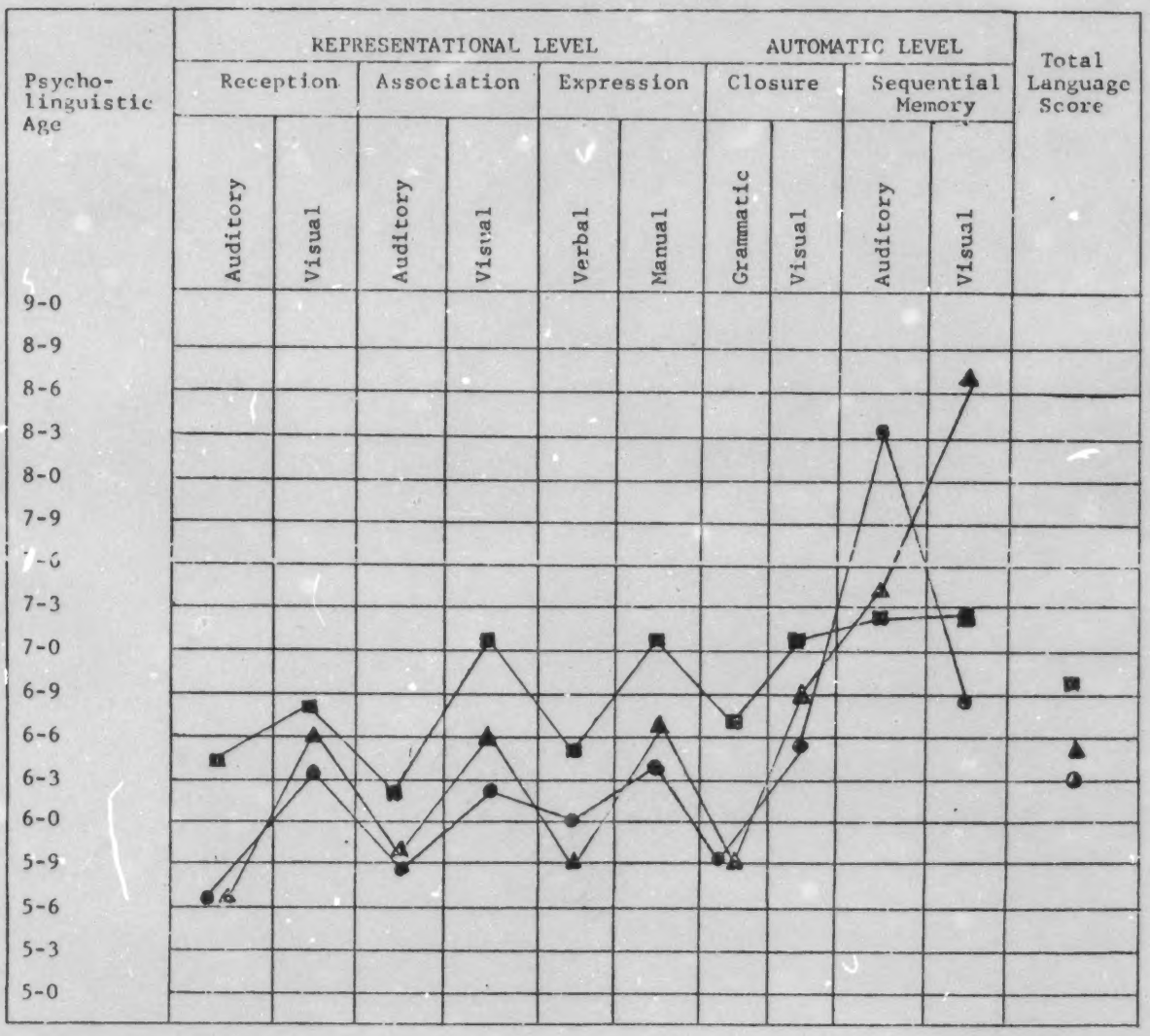
5. The correlations among the whites were generally consistent with those reported for the standardization sample.

6. With the grade one sample, Auditory Reception, Auditory Association, and Grammatic Closure correlated highest with the Metropolitan Reading Test. At grades two and three, Auditory Association and Grammatic Closure correlated highest with the Stanford Achievement Test.

Comments

The Westinghouse Study is the most extensive study made dealing with the ITPA since it used four to five hundred children at each grade level. The results of this study in terms of race differences and correlations are contrasted with other studies. It is a question whether the impact of Head Start during its initial stages of operation is a fair evaluation of current Head Start programs that now have better organization and more effectively trained teachers.

Figure D-1. ITPA profiles of Head Start children from summer programs at grade two (age 7-5) for subgroups of centers according to racial-ethnic composition*



Key: largely Negro
largely white
Mexican-American

*The Impact of Head Start, Vol. 1, Westinghouse Learning Corporation, Ohio University, 1969, p. 214.

Jorstad, D. Psycholinguistic learning disabilities in twenty Mexican-American students. Journal of Learning Disabilities, 1971, 4, 143-149.

Purpose

This study presented a composite ITPA profile from the scores of Mexican-American students having reading difficulties.

Subjects

The subjects were 20 disadvantaged Mexican-American students from Coachella (California) School District whom reading specialists referred to the author as having unusual problems that needed further diagnosis. The average CA was 8-1.

Procedure

The revised ITPA was administered to each of the subjects, and results were compiled as one composite profile.

Results

1. The mean Scaled Score of 27 was significantly below the standardization norms.

2. The Auditory-Vocal channel was inferior to the Visual-Motor channel.

3. The Visual Sequential Memory subtest was the highest of the scores.

Comments

The profile of Mexican-American children is typical of bilingual children, showing an Auditory-Vocal channel disability as compared to the Visual-Motor channel functions.

The disadvantaged Mexican-American's children's profile for 7-5 year olds (The Impact of Head Start, Westinghouse Learning Corp.) is similar to this profile except for a much lower Verbal Expression score.

Kuske, I.I., Jr. Psycholinguistic abilities of Sioux Indian children. Unpublished doctoral dissertation, University of South Dakota, 1969.

Purpose

The purpose of this study was to compare the psycholinguistic responses of mentally handicapped Sioux children, non-mentally handicapped Sioux children, mentally handicapped Caucasian children, and the standardization population of the revised ITPA.

Subjects

Three groups of children, 50 mentally handicapped Sioux, 50 non-mentally handicapped Sioux, and 50 mentally handicapped non-Indian, were selected from South Dakota public schools. The mentally handicapped groups were matched on the basis of MA, CA, IQ, sex, and rural-urban environment. These were matched with the ITPA normative population and non-mentally handicapped Sioux group on the basis of MA. Ethnic membership required at least 25% Sioux blood. All mentally handicapped subjects were selected from special education classes.

Procedure

The revised ITPA was administered to each subject. Inter-group raw score comparisons, using "t" tests, were made among the three research groups and between the groups and the normative population. Intra-group profile analyses were made to determine psycholinguistic pattern similarities among the groups.

Results

1. Non-mentally handicapped Sioux children's performance was significantly inferior (.05 level) to the normative population on all but Visual Closure and Sound Blending subtests.

2. Matched for MA, the mentally handicapped Sioux children performed significantly better than the non-mentally handicapped Sioux children on Visual Association and Visual Sequential Memory subtests.

3. Mentally handicapped Sioux children performed significantly better than did the mentally handicapped non-Indian children on Visual Association, Visual Closure, Visual Sequential Memory, and Sound Blending subtests.

Comments

The inferior performance of Sioux children as compared to the normative population is similar to the results of Lombardi on Papago children. This study does not show, however, the superiority in Visual Sequential Memory as do the studies of Lombardi and Garber.

Kuske, I. I.

Results (Continued)

6. Auditory Association, Auditory Reception and Grammatic Closure were the best predictors of school readiness and school achievement. These were also the subtests in which the children performed most poorly.

7. Figure D-3 presents the profiles of the three ethnic groups for grade 2 extracted from the Head Start report.

Comments

Although no statistical tests were made to determine the significance of differences, the large sample size indicates that most differences observed are likely to show statistical significance.

These results are in keeping with the other studies on psycholinguistic differences among ethnic groups. Visual Sequential Memory was lowest for the black children, but was higher than most of their other subtest scores.

Lombardi, T. P. Psycholinguistic abilities of Papago Indian children. Exceptional Children, 1970, 36, 485-494.

Purpose

This study investigated the psycholinguistic abilities of Papago Indian school children in integrated and segregated first and third grades.

Procedure

The revised ITPA was administered to a stratified random sample of 80 Papago children who were selected from a 70 mile radius of Tucson, Arizona. Half of the subjects were in the first grade and half in the third grade; an equal number were in integrated and segregated schools. Data were analyzed by a comparison of mean scaled scores using "t" tests.

Results

1. The Papago group scored significantly below the standardization group (101 level) on the ITPA composite psycholinguistic age score and on 11 subtests.

2. The Papago children were significantly superior to the standardization group (.05 level) on the Visual Sequential Memory subtest.

3. Papagos as a group revealed deficits in the auditory-vocal channel as demonstrated by an intra-profile analysis.

4. A comparison of the first and third grade Papago group indicated no significant differences on the ITPA composite PLA scores and on 10 of the subtests. The first graders were significantly superior to the third graders (.01 level) on Auditory Reception and Grammatic Closure.

5. The subjects from integrated schools performed better than those from segregated schools (.05 level) on composite PLA score and on seven of the subtests, five of which were at the representational level.

Comments

The auditory-vocal channel deficit is not surprising since the Papagos are a bilingual ethnic group.

The fact that the first graders performed better than third graders on two auditory-vocal subtests make one question the efficacy of their school instruction in language. The fact that those subjects attending integrated schools performed better on seven out of twelve subtests seems to indicate that contact with English speaking peers is helpful to their psycholinguistic development as measured by the ITPA.

Michaelson, A. W. Psycholinguistic differences of monolingual and bilingual culturally-deprived children. Unpublished masters thesis, Colorado State University, 1970.

Purpose

This study attempted to determine whether the psycholinguistic abilities of bilingual children from culturally-deprived homes differ from the psycholinguistic abilities of monolingual children from the same type of home.

Subjects

The sample consisted of ten bilingual (Spanish and English) and ten monolingual culturally deprived pre-school children enrolled in Head Start programs in Ft. Collins, Colorado. The bilingual group consisted of six girls and four boys with a mean CA of 59.6 months. The monolingual group was composed of seven girls and three boys with a mean CA of 59.3 months. All the children had normal hearing, vision, and IQ. Children with severe motoric difficulties and severe articulation problems were eliminated from the study.

Procedure

Each child was administered the revised ITPA. Data were analyzed by "t" tests.

Results

1. The bilingual group scored significantly below the monolingual group (.05 level) on two out of ten subtests (Auditory Association and Auditory Sequential Memory) and on the auditory-vocal channel of communication.

2. The lowest subtest mean scaled scores for bilingual subjects were Auditory Association (30.6) and Grammatic Closure (30.8); for monolingual subjects they were Visual Memory (32.5) and Visual Association (34.4).

3. The highest subtest mean scaled score for both groups was Manual Expression (38.3 bilingual; 39.3 monolingual); the second highest for bilingual children was Visual Closure (37.7), and for the monolingual children the second highest was Visual Reception (37.5).

Comments

The lower auditory-vocal channel scores for the bilingual subjects are not surprising since we would assume that these subjects would have less mastery of English than the monolingual group, due to less exposure to English. All mean scaled scores for both bilingual and monolingual subjects are within average range of the standardization population. The small n of 10 for each group makes conclusions tenuous.

Norcombe, B., and Moffitt, P. Cultural deprivation and language defect: Project Enrichment of Childhood. Australian Psychologist, 1970, 5, 249-259.

Purpose

This study evaluated the psycholinguistic functioning of Australian Aboriginal children and European children enrolled in an experimental pre-school intervention program.

Subjects

Thirty-six children--18 Aboriginal and 18 European--from an Australian rural setting (Bourke, New South Wales) constituted the sample. The mean age at the time of testing was 43 months with a range of 36 to 48 months.

Procedure

All subjects were administered the revised ITPA, Form A of the PPVT, and the Vocabulary and Geometric Design subtests of the WPPSI. Group mean scaled scores were compared by "t" tests.

Results

1. For the Aboriginal group the three subtests of Visual Closure, Auditory Sequential Memory, and Visual Sequential Memory fall within the normal range, while major deficits appear in Auditory Association, Visual Association, Manual Expression, Grammatic Closure, and Auditory Reception subtests.

2. The Aboriginal group scored significantly below the European group on eight subtests of the ITPA (all but Visual Closure and Auditory Sequential Memory). They were also significantly below the European group on the two WPPSI subtests.

Comments

The Aboriginal group appeared to be higher on the automatic level subtests than on the representational level subtests, the opposite of what is found in a mentally retarded population.

Pickering, D. M. An examination of the psycholinguistic abilities of Grade 2 children of differing socio-economic status and ethnic background--Greek and Australian. Proceedings of the Australian College of Speech Therapy Conference, Melbourne, 1973, 53-70.

Purpose

The purpose of this study was to compare the psycholinguistic abilities of children (Greek and Australian) from low SES environments with the psycholinguistic abilities of children (Greek and Australian) who are attending schools in middle class environments. The study also compared the psycholinguistic abilities of Greek migrant children with the psycholinguistic abilities of Australian children of similar SES.

Subjects

The sample consisted of 60 children attending Grade 2 classes in eight Victorian metropolitan schools. The 60 subjects were divided into four groups: Low-SES Greek Migrant; High-SES Australian. The groups were defined by the following criteria: a) presence or absence of a parental English-language model, b) socio-economic status.

Procedure

Subject abilities were assessed in the following areas: 1) Psycholinguistic abilities; 2) reading skills; and 3) general abilities.

The battery consisted of:

1. The Illinois Test of Psycholinguistic Abilities.
2. The Wepman Test of Auditory Discrimination.
3. The Neale Analysis of Reading.
4. The Peabody Picture Vocabulary Test.
5. The Raven's Progressive Matrices (Colored).

Results

1. Australian children of low-SES have psycholinguistic disabilities relative to their high-SES peers, mainly in the area of auditory-vocal functioning.

2. There appears to be some evidence to suggest that the "Cummulative-deficit" is operating in Australian schools. The longer children of low SES attend school, the worse is their educational situation relative to their high-SES peers.

3. The Greek migrant child shows a similar pattern of auditory-vocal channel disabilities as does the low-SES child, with additional deficits in reading skills.

Pickering, D. M.

Results (Continued)

4. Greek migrant children show a disability in Auditory Sequential Memory which may be due to their relative unfamiliarity with the English numerical system.

5. The low-SES Greek migrant appears to approach the achievement level of his low-SES Australian peer somewhere between mid-Grade two and mid-Grade three, after approximately 3½ to 4½ years of schooling.

6. In the absence of a parental-language model for English, the Greek migrant child adopts the language model of his peers with the result that migrant children attending high-SES schools develop a significantly superior mastery of vocabulary and syntax, which appears to reflect in their performance on associational tasks.

Comments

This is a useful study in which the channels and levels of the ITPA appear to detect differences in skills of Greek migrant children under two environmental conditions.

Stephenson, B. L., and Gay, W. O. Psycholinguistic abilities of black and white children from four SES levels. Exceptional Children, 1972, 38, 705-709.

Purpose

To compare the psycholinguistic abilities as measured by the ITPA of four groups of black and white children from lower level, upper lower, lower middle, and upper middle SES levels.

Procedure

Eighty black and 80 white first grade children were given the ITPA. These children tested between 90 and 110 IQ on the PPVT.

Results

1. The socioeconomic status was significantly related to psycholinguistic abilities for the white children, but this result was not pronounced for the black children.

2. The black children were superior in Auditory Sequential Memory, confirming other studies of ethnic difference.

3. All groups were low in verbal expression.

Comments

The authors did not describe the qualifications of the examiners. In view of the results of low verbal expression ability for all groups, high and low, which is contrary to other studies, one may question the administration and scoring of the ITPA test of verbal expression in this study.

Wright, L. S. Perceptual and cognitive characteristics and their relationship to social factors and academic achievement in third grade conduct problem boys. Unpublished doctoral dissertation, University of Illinois, 1969.

Purpose

This study investigated selected perceptual and cognitive characteristics of third grade boys referred by their teachers as having conduct problems, and determined how social and economic factors and academic achievement interrelate with those perceptual and cognitive characteristics.

Subjects

Subjects were forty-seven third grade boys, referred by experienced teachers in a midwest city school system as children whom they considered to be moderate to severe conduct problems on characteristics taken from the Quay and Peterson Behavior Problem Checklist.

Procedure

All subjects were administered the following tests by qualified examiners: Bannatyne Visuo-Spatial Memory Test, Graham-Kendall Memory for Designs Test, Wepman Auditory Discrimination Test, Revised ITPA, WISC Vocabulary subtest, California Short Form Test of Mental Maturity, and the Iowa Test of Basic Skills. Reading achievement was determined by the Reading Comprehension subtest of the Iowa Test of Basic Skills, and a reading performance index was computed for each subject. Statistical analyses included product moment correlations, one-way and repeated measures, analyses of variance, and chi square median tests.

Results

1. On the ITPA, this sample of conduct problem boys scored significantly below (.05 level) the normative population on Grammatic Closure, Visual Memory, Verbal Expression, and Auditory Reception, and scored significantly above (.05 level) on Sound Blending.

2. The working class Negro group scored signficantly below the normative population on all the subtests of the ITPA except Auditory Memory.

3. No significant correlations were found for either the Negro or White subjects between achievement and performance on the Bannatyne, the Graham-Kendall, or the Wepman tests. For the Negro subjects the following positive correlations between achievement (Iowa Test of Basic Skills) and ITPA subtests were statistically significant:

Language Usage and Auditory Memory	r = .46
Reading and Manual Expression	r = .52

Wright, L. S.

Results (Continued)

4. There were many significant positive correlations between achievement and ITPA subtests for white subjects.

Comments

The fact that this sample scored significantly better than the ITPA normative population on Sound Blending is probably due to the fact that the phonics approach to reading was taught in this school system.

The fact that Auditory Memory was the one subtest on which the working class Negro subjects did not perform significantly poorer than the ITPA normative population is in keeping with other research on ethnic group profiles on the ITPA. Ten Negro subjects had psycholinguistic strengths on subtests in the automatic level, but only 4 had strengths at the representational level; the only deficits at the automatic level were on Grammatic Closure subtests.

The general lack of significant relationships between academic achievement for the Negro subjects and performance on the other measures suggest that for them other variables are more important to achievement than those investigated in this study.

von Isser, A. Psycholinguistic abilities in children with epilepsy. Unpublished doctoral dissertation, University of Arizona, 1974.

Purpose

The purpose of this investigation was to study the linguistic, cognitive, memory, and perceptual functions of a group of petit mal epileptic children and a group of children evidencing mixed epileptic seizures to determine whether any differences would exist when these two groups were compared with each other or with a comparable group of non-epileptic children of average intelligence.

Subjects

Twenty-two children with purely defined petit mal epilepsy (10 males and 12 females) and twenty-eight children diagnosed as having mixed epileptic seizures served as subjects for this research. All were in the PLQ range of 80 to 120 and an age range from three through nine years and were on medication to control their seizures. A contrast group equivalent with respect to age and intelligence was obtained randomly from the standardization population of the ITPA.

Procedure

Each child in the experimental group was individually administered the ITPA. One-way analyses of variance were employed as the statistical measure.

Results

1. There were no significant differences between the 50 epileptic children and the 50 subjects in the normal contrast group on any of the ten subtests of the ITPA.

2. No significant differences were found between the 22 petit mal epileptic children and the 28 children in the mixed seizure group on any of the ten subtests of the ITPA or on the mean Scaled Score, Psycholinguistic Age, or Psycholinguistic Quotient.

3. The author concluded that, at least for children whose seizures are under control, there exists no necessity for special educational provisions strictly on the basis of a diagnosis of epilepsy.

Comments

This study did not include a heterogeneous group of epileptic children, hence the results can apply only to children within the average range of intelligence.

SECTION E

SCHOOL ACHIEVEMENT STUDIES: READING

Bartin, N. G. The intellectual and psycholinguistic characteristics of three groups of differentiated third grade readers. Unpublished doctoral dissertation, State University of New York at Buffalo, 1971.

Purpose

The study attempted to determine the extent to which specific intellectual processes and selected elements of psycholinguistic behavior would differentiate among normal third grade pupils demonstrating three distinctly different progress patterns in reading.

Subjects

Subjects were seventy-three third grade suburban pupils exhibiting three distinct levels of reading performance, Average Progress Readers, Mildly Disabled Readers, and Severely Disabled Readers.

Procedure

The categories of readers were determined by their performance on silent and oral standardized reading tests and on recent reading progress. The ITPA and WISC were administered as measures of psycholinguistic and intellectual abilities. Data were examined through analyses of variance and covariance and by "t" tests using the .05 level of confidence.

Results

1. There was found a significant difference between Average Progress Readers and Severely Disabled Readers on WISC full scale and verbal scale scores, on WISC Arithmetic and Digit Span Subtests, and on ITPA Auditory Closure and Sound Blending subtests. On the ITPA Visual Closure subtest, the poor readers were significantly superior to the Average Progress Reader.

2. There was found a significant difference between Average Progress Readers and Mildly Disabled Readers on WISC Information and Block Design subtests and on ITPA Auditory Closure and Sound Blending subtests.

3. The Mildly Disabled and the Severely Disabled Readers differed significantly only on the ITPA Auditory Closure subtest.

4. The WISC full scale IQ and the ITPA total score correlated at .61, significant at the .01 level.

Comments

Unexplained are the unlike results as to which WISC subtests differentiated Average Readers from Mildly Disabled and from Severely Disabled Readers. Such a discrepancy was not found with the ITPA: the same two

Celebre, G. Psycholinguistic abilities and oral word recognition associated with relative level of personality adjustment in primary school-age children with minimal brain dysfunction. Unpublished doctoral dissertation, Temple University, 1971.

Purpose

This study investigated the degree to which relative level of personality adjustment accounted for common patterns of psycholinguistic abilities and word recognition skills in children as compared to the patterning accounted for on the basis of their diagnostic-educational placement.

Subjects

Subjects were 104 children, ranging in age from 8 through 10; 52 were in classes for learning disabilities or minimal brain dysfunction and 52 were in regular classes.

Procedure

All subjects were given the revised ITPA, the oral reading section of the WRAT, and the Neuroticism sub-scale or the Children's Personality Questionnaire. Multivariate analysis of covariance and stepwise regression techniques were used to test the hypothesis.

Results

1. Relative level of personality adjustment did not differentiate subjects in terms of either psycholinguistic functioning or oral word recognition skills.

2. Certain "nonconceptual" processing deficits, as reflected in Grammatic Closure, Auditory Closure, and possibly Sound Blending subtests, were important ITPA correlates of word recognition deficiencies.

3. Children in the learning disability group were significantly more deficient than the regular class controls in Auditory Association, Grammatic Closure, Auditory Closure, and Sound Blending subtests.

4. Knowledge of diagnostic-educational placement was a significant predictor of oral word recognition ability.

Comments

The "non-conceptual" or automatic processing deficits of poor word callers which the author refers to have also been found in other studies, namely, Kas (1962), Macione (1969), and Ruhley (1970).

Comments (Continued)

subtest differentiated both groups of disabled readers from the average readers. The results of this study seem to be at some variance with the studies of Kass, Macione, and others which indicated that Visual Sequential Memory differentiated good from poor readers.

Deese, J. C. A study of the discrimination by the subtests of the revised Illinois Test of Psycholinguistic Abilities between successful and unsuccessful readers of normal intelligence. Unpublished doctoral dissertation, Memphis State University, 1971.

Purpose

This study investigated the extent to which subtests of the revised ITPA would distinguish between successful and unsuccessful readers.

Subjects

The sample consisted of children between seven and 10 years of age with IQ's of 85 or above who had been referred to a reading clinic for diagnosis.

Procedure

Unsuccessful readers were those reading one-half to one year below reading expectancy (basing expectation on years in school and IQ) in their second year of school, reading one and one-half years below expectancy if in their third year, and reading two or more years below expectancy if in their fourth year of school. Statistical comparisons using ITPA subtest scaled scores, composite PLA's, and PLQ's included analysis of variance and discriminant analysis of two groups.

Results

1. Significant differences between successful and unsuccessful readers were found on four of the six automatic level subtests (Grammatic Closure, Auditory Sequential Memory, Visual Sequential Memory, and Sound Blending) and on composite psycholinguistic age and psycholinguistic quotient.

2. No significant differences were found for the representational level subtests or for Visual Closure or Auditory Closure.

Comments

The results of this study are generally in harmony with those of Macione, Celebre, Ikeda, and Bartin, which also indicated that automatic level subtests differentiate good from poor readers.

Elkins, J., Andrews, R. J., and Cochrane, R. G. Multi-variate relationships between intellectual and reading measures in third grade children. Unpublished manuscript, University of Queensland, 1974.

Purpose

This study investigated the relationship between a set of cognitive measures, including the ITPA, and a set of reading tests using two multivariate techniques: factor analysis and canonical correlation.

Subjects

A sample of third grade children was obtained by selecting 12 children at random from each of a representative sample of 12 schools in Brisbane, Australia.

Procedure

1) An iterative principal factor analysis was performed on the correlation matrix after the effect of chronological age had been partialled out. Seven factors with eigenvalues greater than 1.0 were rotated using the varimax criterion.

2) A canonical correlation analysis was performed between the cognitive variables, including the ITPA and chronological age, and the reading measures.

Results

1. Seven principal factors accounted for 63% of the variance. Factor I was a reading factor, with loadings of .66 to .90 from the reading tests. Grammatic Closure was the only other test with a substantial loading (.43).

2. Visual Reception and Visual Association, but not Manual Expression loaded on Factor II which was determined by several reference tests as Visual Perception of Spatial Relations.

3. All representational level subtests except Auditory Reception loaded on Factor III and it appears to involve meaningful relationships.

4. Auditory Association (.38), Grammatic Closure (.40), and Sound Blending (.46) loaded on Factor IV.

Comments

This study's results are not dissimilar to others, with Grammatic Closure relating to reading in third grade children. The value of this study is in the use of two multivariate techniques.

Golden, N. E., and Steiner, S. R. Auditory and visual functions in good and poor readers. Journal of Learning Disabilities, 1969, 2, 476-481.

Purpose

This study attempted to determine the differences between high and low achieving readers of normal intelligence on six tests of specific visual and auditory functions.

Subjects

Subjects were twenty second grade children (8 girls and 12 boys) from three Illinois cities with IQ's between 90 and 110 on the Stanford-Binet, a deviation of at least one year above or below mental age reading expectancy on measures of silent and oral reading, and no evidence of auditory or visual defects. The 20 subjects were matched by IQ, MA, and CA into 10 pairs, matching a good reader with a poor reader.

Procedure

Subjects were administered three auditory tests from the revised ITPA (Sound Blending, Auditory Sequential Memory, and Auditory Closure) and three tests of visual ability (the Monroe Visualization Test and the Visual Closure and Visual Sequential Memory subtests of the revised ITPA).

Results

1. The good readers were significantly superior (at least at .05 level) to the poor readers on Sound Blending, Auditory Sequential Memory, and the Monroe Visualization Test. The other subtests failed to differentiate between good and poor readers.

2. Significant intercorrelations included: Silent Reading; .60 with Sound Blending and .58 with the Monroe Visualization Test; Oral Reading; .67 with Sound Blending and .77 with the Monroe Visualization Test.

Comments

This study with only 10 subjects in each group indicates that the Sound Blending subtest and the Monroe Visualization Test differentiate between good and poor readers. A larger N is needed for more conclusive results.

Guthrie, J. T., and Goldberg, H. K. Visual sequential memory in reading disability. Journal of Learning Disabilities, 1972, 5, 41-46.

Purpose

The purpose of this investigation was to relate Visual Sequential Memory to reading in normal and disabled readers.

Subjects

The subjects included 81 normal readers (mean CA of 8-5, mean WISC IQ of 98, and mean Gray Oral Reading Test score of 2.5) and 43 disabled readers (mean CA of 10-3, mean WISC of 99, and mean Gray Oral Reading Test score of 2.2). The disabled readers were two or more years behind their CA in reading achievement. All subjects were drawn from the Baltimore Public Schools, the laboratory school of Towson State College, and a summer remedial reading program conducted at the Kennedy Institute of Baltimore.

Procedure

All subjects were given the Benton Visual Retention Test (BVR), the Visual Sequential Memory subtest of the revised ITPA (ITPAM), the Gray Oral Reading Test (GO). The experimental group was also given the Metropolitan Reading Comprehension subtest (MRC): the control group was given the Knox Cube Test (KCT), the Visual Closure subtest of the revised ITPA (ITPAVC), and the Wide Range Achievement Test (WRAT). Data was analyzed by correlations and partial correlations to partial out the variable of CA.

Results

1. For the normal readers, the correlations among ITPAM, BVR, KCT, and GO were all significant at the .01 level; students who performed well on the Gray Oral Reading Test also performed well on the three measures of visual memory.

2. For disabled readers, none of the correlations among ITPAM, BVR, GO, and the MRC were significant at the .01 level.

3. The Benton Test correlated higher with reading than did other tests for disabled readers.

4. Intercorrelations among measures of visual memory and perception for normal readers are all significant at the .01 level as follows:

ITPAM and BVR	.38
ITPAM and KCT	.38
ITPAM and ITPAVC	.42
BVR and KCT	.34
BVR and ITPAVC	.46
KCT and ITPAVC	.49

Guthrie, J. T., and Goldberg, H. K.

Comments

The correlation of .38 between the Knox Cube Test and the ITPA Visual Sequential Memory is quite a bit higher than that obtained by Paletz and Hirshoren for the same age children.

Low correlations of reading with the ITPA Visual Sequential Memory Test for disabled readers is possibly due to the restricted range and the ceiling effect of using children whose mean CA was 10-3, above the standardization norms. Studies which use subjects above the intended age range for ITPA produce few valid results and should be discouraged.

Ikeda, M. The relationships between the ITPA, reading performance, and IQ of third grade children. Unpublished doctoral dissertation, University of New Mexico, 1970.

Purpose

This study investigated the relationships between the ITPA, reading performance, and IQ of children in regular third grade classrooms.

Subjects

Fifty subjects regularly enrolled in the third grade at Sandia Base School were selected by stratified random sampling.

Procedure

All subjects were administered the ITPA, PPVT, and Gates MacGinitie Reading Tests, Primary C. The Bond and Tinker Reading Expectancy formula was used as a criterion to determine reading ability, which was classified as good, average, and poor. Results were analyzed by means of product-moment correlations, analysis of variance, and analysis of covariance utiiizing the .05 level of significance.

Results

1. Good, average, and poor readers did not differ on the subtests of the ITPA, or on the 3 dimensions of channels, processes, and levels of organization.

2. The subtests, Auditory Association, Grammatic Closure, and Sound Blending, correlated significantly with reading ability: auditory-vocal channel, association process, and automatic level.

4. The PPVT MA did not correlate signficantly with reading, but, as would be expected, the PPVT IQ correlated with Visual Reception, Auditory Reception, Verbal Expression, Grammatic Closure, Visual Memory, Sound Blending, and total score.

Comments

Since normal third grade children were used, it is possible that many of them reached the ceiling of the norms, thus effecting differences. One could also raise the question of whether differences among good and poor readers were large enough to bring out significant differences in psycholinguistic functions.

Kirby, E. A., Lyle, W. and Hurble, B. R. Reading and psycholinguistic processes of inmate problem readers. Journal of Learning Disabilities, 1972, 5, 295-298.

Purpose

This study examines the use of the ITPA with adult prison inmates and the relationships of the ITPA subtests to reading performance among these subjects.

Subjects

Twenty-four adult inmates with low reading skills were selected from one prison.

Procedure

Multiple regressions were computed using the ITPA subtests as predictors and the Gates vocabulary and comprehension tests as criteria.

Results

Five auditory channel subtests (Auditory Reception, Auditory Association, Auditory Closure, Sound Blending, and Grammatic Closure) were significant predictors of reading comprehension ($R = .65$) and reading vocabulary ($R = .70$). Similar relationships were found for reading speed ($R = .60$) and reading accuracy ($R = .63$). No visual channel subtests contributed significantly to the prediction of reading performance.

Comments

This study is weakened by the failure to report fully the characteristics (e.g. IQ and reading level) of the subjects, and the level of performance on the ITPA subtests, especially since the designed use of the ITPA is up to 10 years. The results from a multiple regression analysis with a sample of only 24 should be treated with caution. Although the addition of the PPVT to the prediction equation produced only a marginal improvement, it should be noted that the PPVT correlated as highly with reading as any of the ITPA subtests, and thus the PPVT has much shared variance with the ITPA.

Lagerman, A. P. Psycholinguistic characteristics of children with reading disabilities, and the effects of remediation of psycholinguistic development and reading achievement. Unpublished doctoral dissertation, Marquette University, 1970.

Purpose

This study had a two-fold purpose: (1) to determine if psycholinguistic disabilities at the nonsymbolic (automatic) level are more characteristic of children with reading disabilities than those at the symbolic (representational) level; and (2) to determine the effectiveness of two programs of remediation on the reading achievement and psycholinguistic development of the sample of children with learning disabilities.

Subjects

Subjects were twenty-five children found to be reading at least one year below expected level and 15 children scoring at grade level; all 40 children were either third or fourth graders.

Procedure

Subjects were administered the vocabulary and reading sections of the California Achievement Test and the WISC. The Bond and Tinker Reading Expectancy Formula was applied to determine expected reading level. Those 25 subjects found to be reading at least one year below expected reading level were also given the ITPA, and automatic level and representational level scores were compared by a "t" test.

Twenty-two of the above subjects exhibited deficits in psycholinguistic functioning. The second part of the study divided those 22 children into two treatment groups on the basis of sex and degree of disability. One group was given treatment based on their psycholinguistic deficits, while the other group was given treatment based on their reading skill deficits. The treatment groups met twice a week for a total of 50 minutes per week for four months. After the treatment period, the ITPA and reading achievement tests were readministered. Sixteen analyses of variance were performed.

Results

1. There was no significant difference found between the sample's automatic level psycholinguistic skills and their representational level psycholinguistic skills.

2. There were no significant differences found in the gains made by the two groups in reading achievement or on the ITPA with the exception of the Auditory Reception subtest, and the gain was in favor of the reading skills treatment group.

Lagerman, A. P.

Comments

Since this study is not in harmony with the studies by Macione and others, which showed that the automatic level is more deficient than the representational level in children with reading disabilities, an explanation is in order. It is possible that the subjects, being third and fourth graders, scored at the ceiling of the norms of the ITPA, thus depressing the scores and eliminating any possible differences.

Macione, J. Psycholinguistic correlates of reading disabilities as defined by the Illinois Test of Psycholinguistic Abilities. Unpublished doctoral dissertation, University of South Dakota, 1969.

Purpose

The purpose of this investigation was to determine differences in psycholinguistic abilities as measured by the ITPA between disabled and non-disabled readers.

Subjects

Two groups of 28 disabled and 28 non-disabled boys in second and third grade were matched on scholastic aptitude, age, grade, and school attended. A disabled reader was defined as one retarded more than .5 of a year at the conclusion of grade 2 and more than .7 of a year at the conclusion of grade 3.

Procedure

The revised ITPA was administered to each subject in the two groups. Data were analyzed by "t" tests.

Results

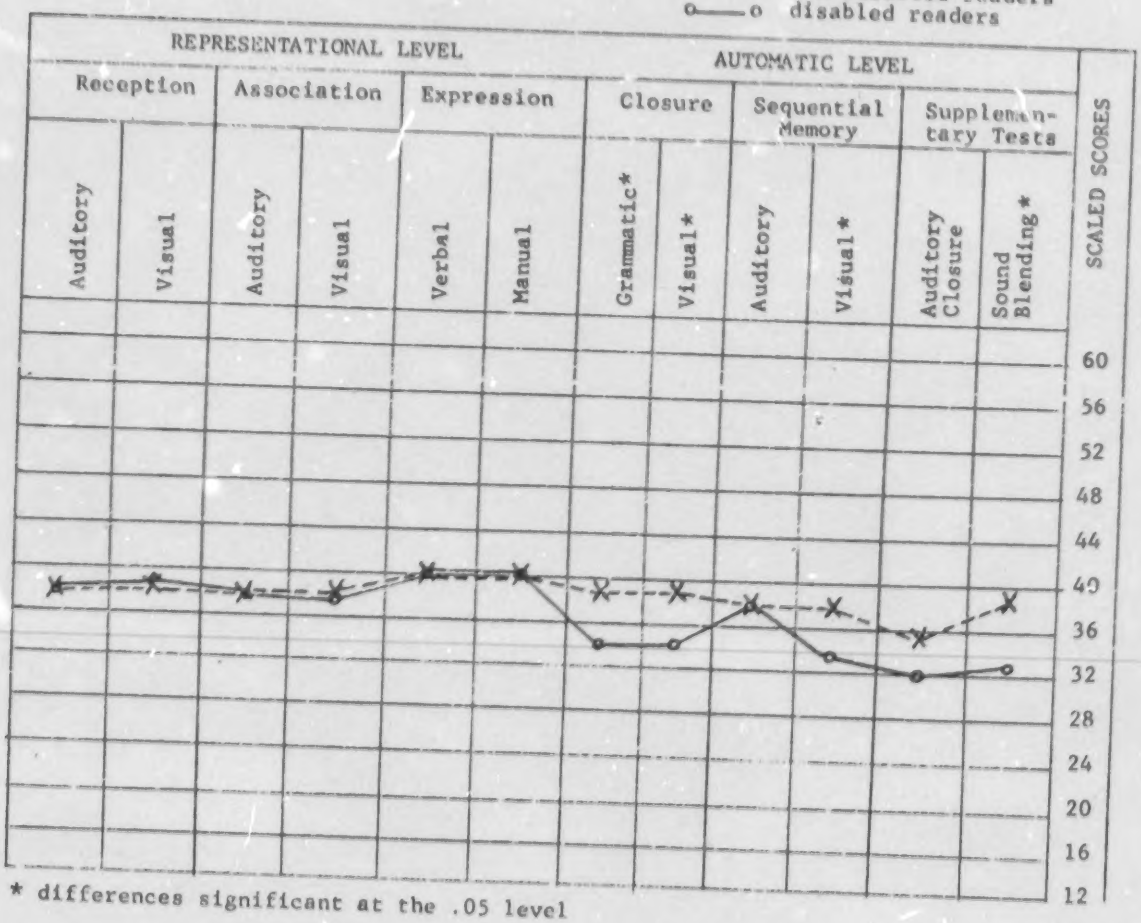
The general pattern of psycholinguistic functions for the disabled readers were higher functioning at the representational level than at the automatic level. See Figure E-1. The disabled readers were significantly (.05 level) lower than 4 of the 6 subtests at the automatic level: Grammatic Closure, Visual Closure, Visual Sequential Memory, and Sound Blending.

Comments

These results are similar to those of Kass (1962) with the experimental edition of the ITPA, to Ruhly (1970), and to Celebre (1971) but not in agreement with Lagerman (1970) who found no difference between automatic and representational level performance.

Figure E-1. Profile of Scaled Scores for Disabled Readers and Non-disabled Readers.

x----x non-disabled readers
o——o disabled readers



* differences significant at the .05 level

Merlin, S. B. The psycholinguistic and reading abilities of educable mentally retarded readers. Unpublished doctoral dissertation, West Virginia University, 1971.

Purpose

The study attempted to determine why some public school educable mentally retarded children learn to read while others do not, by comparing the psycholinguistic and reading abilities of good and poor readers.

Subjects

Twenty-five good and poor readers were selected from intermediate and junior high school education classes of a southwestern Pennsylvania School District. Poor readers scored below 2.5 grade level and good readers scored above 3.0 grade level and near their expectancy level. Good readers ranged in CA from 10.6 to 15.0, in MA from 7.5 to 10.9, and in IQ from 60 to 80. Poor readers ranged in CA from 10.6 to 15.6, in MA from 7.2 to 11.9, and in IQ from 57 to 80.

Procedure

Subjects were administered the Spache Diagnostic Reading Scales and the revised ITPA. Statistical analysis of results included covariance and correlation.

Results

1. Good readers were significantly superior to poor readers in the representational and automatic levels, on auditory-vocal and visual-motor channels, and on composite PLA. They were also superior on the sub-tests of Auditory Reception, Grammatic Closure, Auditory Association, Visual Sequential Memory, Visual Closure, Auditory Sequential Memory and Manual Expression.

2. Spache Potential Reading Level score and ITPA composite Psycholinguistic Age score obtained higher correlations with reading scores and were considered better measures for determining reading potential than MA, CA, and IQ.

Comments

The ITPA subtests Auditory Closure and Sound Blending did not differentiate good from poor readers in this study. The author stated that all the teachers reported teaching phonics, which probably accounts for this lack of difference between good and poor readers. Differences in results found among studies may be due to differences in methods of teaching.

Ruhly, V. A study of the relationship of self-concept, socioeconomic background, and psycholinguistic abilities to reading achievement of second grade males residing in a suburban area. Unpublished doctoral dissertation, Wayne State University, 1970.

Purpose

This study explored the relationship of reading achievement to socio-economic background, reported self-concept, and psycholinguistic abilities.

Subjects

Subjects were 128 male children in the 7th month of the second grade in six elementary schools in Birmingham, Michigan.

Procedure

Each subject was administered (a) the Word Meaning and Word Study Skills from the Stanford Achievement Test, (b) Role Expectations, Self Adequacy, and Self-Concept subtests of the SCAMIN--Self-Concept and Motivation Inventory: What Face Would You Wear?, and (c) the revised Illinois Test of Psycholinguistic Abilities. Information as to parental education, father's occupation, and IQ (from SRA Test of Primary Abilities) was secured from school records. The subjects were divided into upper and lower fifty percent on the basis of their scores on the standardized reading test. Analysis of covariance design was used to remove, in turn, the effects of school, teacher, and tested intelligence.

Results

1. A significant difference was found between reported self-concept of the high and low readers in terms of role expectations with the low readers reporting greater role expectations. No significant difference was found between reported self-concept in terms of self-adequacy and total self-concept.

2. A significant difference was found between psycholinguistic abilities of high and low readers; auditory modality functioning and specific automatic language skills were significantly related to high achievement in reading.

3. No significant differences were found between high and low readers on the basis of parental education or father's occupation.

Comments

Other studies (Kass, 1962; Macione, 1969; Celebre, 1971) have revealed an automatic skill deficit in poor readers which seems to be a corollary to this study's finding that automatic language skills were significantly related to high achievement in reading.

SECTION F

SCHOOL ACHIEVEMENT STUDIES: SPELLING

Bannatyne, A. D., and Wichiarajote, P. Relationships between written spelling, motor functioning and sequencing skills. Journal of Learning Disabilities, 1969, 2, 4-16.

Purpose

This study investigated whether or not there were any significant differences between boys and girls and between good and poor spellers on the factors of meaningful motor functioning, balance, handedness, visuo-spatial ability, and various auditory and vocal skills.

Subjects

The sample consisted of 50 third graders (30 boys and 20 girls) predominantly middle class, the majority of whom were coping with regular third grade school work.

Procedure

The 50 subjects were given the following battery of tests: (1) the Bannatyne Visuo-Spatial Memory Test, which assesses memory for designs without involving motor activity; (2) the revised ITPA subtests of Auditory Closure, Sound Blending, Auditory Sequential Memory, and Visual Sequential Memory; (3) a standardized graded word written spelling test; (4) two balance tests, standing on one foot with eyes open and standing on both feet with eyes closed; (5) simultaneous writing which requires the writing of numerals 1 through 12 down the page as quickly as possible using both hands simultaneously; (6) two tests of laterality of handedness; (7) the Graham-Kendall Memory-for-Designs test; (8) a letter span test, similar to digit span only using consonants; and (9) the PERC Auditory Discrimination test.

Results

1. There were significant differences (.01 level) between good and poor spellers on the ITPA Sound Blending and the unlearned handedness test of ambidexterity. Differences at the .05 level were obtained on the ITPA Auditory Closure, BVSMT simplified design choices, and balancing on both feet.

2. The written spelling test correlated as follows with ITPA subtests:

Sound Blending	.40 (significant at .01 level)
Auditory Closure	.11
Auditory Sequencing	.21
Visual Sequencing	.06

Comments

This is one of the few studies available relating written spelling and psychological processes, with average children. Spelling has not been researched as frequently as reading. More studies on this area are needed.

F 1

Zbinden, W. R. Psycholinguistic and perceptual correlates of spelling in educable mentally handicapped children. Unpublished doctoral dissertation, University of Illinois, 1970.

Purpose

The purpose of this study was to determine which psycholinguistic and/or perceptual variables included in this study correlated and accounted for the observed variance in the spelling achievement of educable mentally handicapped children.

Subjects

Subjects were 74 children (46 males and 28 females, 59 white and 15 blacks) within the CA range of 8-5 and 12-8 and within the IQ range of 60 to 83 who were able to recognize the letters of the alphabet and to write them with 2 or less errors. Each subject was within the normal range of vision and hearing.

Procedure

Spelling achievement was measured by a recall spelling test of nonsense words, a recognition test of nonsense words, two forms of a standardized spelling achievement test, and a combined (total sum) spelling score. Each subject was given the revised ITPA, the Frostig Developmental Test of Visual Perception (revised edition), the Wepman Auditory Discrimination Test, the Bannatyne Visuo-Spatial Memory Test, and an individual IQ test. Pearson product-moment correlations and stepwise multiple correlations were used to analyze the data.

Results

1. Grammatic Closure correlated highest with the different spelling tests.

2. Spelling was more closely associated with the automatic sequential or nonmeaningful level than the representational or meaningful level tasks of the ITPA.

3. Auditory-vocal channel at the automatic-sequential level contributed most of the variance in predicting spelling of nonsense words and combined spelling score.

Comments

This is one of the few studies available relating spelling and psychological processes in mentally retarded children. It is not known from the data how many of the children reached the ceiling on some ITPA tests, thus restricting the results.

SECTION G

REMEDIATION STUDIES

Arnoult, J. F. A comparision of the psycholinguistic abilities of selected groups of first grade children. Unpublished doctoral dissertation, State College, Mississippi, August 1972.

Purpose

The purpose of this study was to determine the effect of Project Head Start on measured psycholinguistic ability of first grade pupils. Race was also examined to determine if the differences in scores earned by children of different races, significantly influenced the age scores from the ITPA of both the experimental and control groups.

Subjects

Subjects were 120 first grade students. Sixty had previously attended a Head Start Program and 60 had had no Head Start experience. Selection criteria were: (1) IQ of subjects fell within the range 95-105. Chronological ages of children were between 6-1 and 6-5; (2) Both Head Start and non-Head Start groups were subdivided into subgroups of Negro and Caucasians; (3) An equal number of males and females were chosen from the two races of Head Start and non-Head Start groups.

Procedure

The ITPA was administered to all subjects during the first calendar month of the 1971-72 academic year. Two-way analysis of variance was used in order to test for significance between all subgroups on PLA.

Results

1. Negro children who had participated in Head Start earned significantly higher scores on the ITPA than Negro children who had not participated in Head Start.

2. Caucasian children who had participated in Head Start earned significantly higher scores than did those Caucasian children who had not participated in Head Start.

3. Caucasian children earned significantly higher scores on the ITPA than did Negro children for Head Start and non-Head Start groups.

Comments

The study indicates that Head Start programs may be helping develop language and cognitive skills, but since no control over assignment of children to treatment groups existed, this cannot be a certain conclusion. It is surprising that ITPA subtest differences were not examined to determine the areas in which differences between groups were most marked.

Butler, M. R. An investigation of operant conditioning and reactive therapy for the remediation of language disorders exhibited by kindergarten and first grade students. Unpublished doctoral dissertation, University of Colorado, 1972.

Purpose

The purpose of this study was to determine the effectiveness of language therapy in the public schools as conducted by the speech therapist and to investigate two methods of language therapy.

Subjects

Subjects were kindergarten and first grade students from 2 elementary schools in Adams County School District, which had a high concentration of students from low income families. A group of 179 subjects were selected from a pool of 412 children.

Procedure

The following test battery was used for language evaluation: (1) Utah Test of Language Development (UTLD); (2) Illinois Test of Psycholinguistic Abilities (ITPA); (3) Carrow Experimental Test of Comprehension of Linguistic Structure (ETCLS); (4) Peabody Picture Vocabulary Test (PPVT); (5) Templin-Darley Tests of Articulation; (6) The Human Figure Drawing Test (HFD); (7) a hearing screening test given prior to the language program.

All subjects were given the UTLD screening test. Students whose language was at least 5 months below their CA were placed in the experiment. Two language programs, a reactive therapy program (principles of play stated by Axline), and an operant conditioning program (Principles of Giradeau and Spradlin) were developed. The therapy programs were administered over a period of 18 weeks. Seven sets of 6 children were assigned randomly to each of the two treatment groups and a control group. Graduate students in speech pathology at the University of Colorado administered the Language Evaluation Test Battery at the conclusion of the therapy program. A teacher questionnaire was devised to measure the effects of the different therapy techniques on classroom behavior, with particular emphasis on social play, emotional responsivity, habits and self-concept. A one-way analysis of variance was applied to the data accumulated from the battery of tests to determine if there was a difference among the treatments.

Results

It was concluded that a language therapy program implemented by the speech therapist can be successful in the public school setting as indicated by the following:

Butler, M. R.

Results (Continued)

(a) Reactive therapy is better than no therapy as measured by all 12 subtests of the ITPA, the Carrow ETCLS and the Human Figure Drawing Test.

(b) Operant conditioning was better than no therapy on the ITPA subtests Auditory Reception, Visual Reception, Auditory Sequential Memory, Visual Closure and Auditory Closure, and the Carrow ETCLS.

(c) During the operant conditioning therapy program the mean number of correct responses temporarily decreased with initial presentation of subsequent language tasks.

(d) During the operant conditioning therapy program subjects increased the mean number of correct responses to the specific language tasks presented by the therapist.

A second conclusion was that subjects who received reactive therapy scored significantly higher than subjects who received operant conditioning therapy on the following tests: subtests Visual Association, Visual Expression, Manual Expression, Auditory Closure, and Sound Blending of the ITPA; on the Carrow ETCLS; on the Human Figure Drawing Test measures of emotional indicators and intellectual quotients; and self-concept and habits items on the teacher questionnaire devised for the study. It was also noted that during reactive therapy, subjects tended to increase the grammatical complexity and length of their verbalizations as the therapy program progresses. There was significant intrasubject, subject, intratherapist and intersubject interaction, suggesting that group interaction is more important to the reactive therapy approach.

Comments

This is a well-designed study which reveals the utility of the ITPA as a measure of language development, especially its sensitivity to changes, both intended and incidental, in children's communication behavior. Although other measures may have more content validity for either treatment program, the ITPA served as an effective detector of change in a wide variety of areas. This is one of the few aptitude-treatment interaction studies.

Cowles, M., et al Psycholinguistic behaviors of isolated rural children with and without kindergarten. South Carolina University, Columbia, School of Education. Paper presented to South Eastern Meeting on Child Development, University of Georgia, Athens, Georgia, April, 1970.

Purpose

This report is part of a longitudinal study designed to assess the effects of kindergarten experience on psycholinguistic abilities of rural children.

Subjects

The subjects were a random sample of thirty-two first grade children who had no kindergarten experience, and thirty-one randomly selected first grade children who had kindergarten experience. All children were from eight low SES elementary schools in Williamsburg County, South Carolina, a predominantly rural county whose economy is basically agricultural.

Procedure

The children without kindergarten experience were administered ten major subtests of the ITPA at the end of 5 months of school (last 2 weeks of January, 1969). The children who had kindergarten experience were administered the ITPA at the end of 5 months of school (last 2 weeks of January, 1970). Data were analyzed by multivariate and univariate analyses of variance.

Results

The MANOVA indicated significant differences between kindergarten and no-kindergarten groups ($p < .001$) with the kindertarten group superior on five subtests (Auditory and Visual Association, Verbal and Manual Expression, and Visual Closure). Grammatic Closure showed a similar but less marked pattern ($p < .07$).

No differences were noticed between boys and girls except for a difference favoring girls on one subtest in the no-kindergarten group. This should not have been reported as the MANOVA was not signigicant.

An analysis of variance on the difference between PLA and CA was significant ($p < .001$). The kindergarten group had much less discrepancy (CA-PLA = 13 months) than the no-kindergarten group (CA-PLA = 23 months).

Comments

This is one of the better studies reported. The use of multivariate procedures for analysis of the data should be commended. Its validity depends upon the truth of the assumption that the groups of children in successive years are not systematically different.

Deutsch, M., Victor, J., Taleporos, E., Deutsch, C., Faigao, B., Calhoun, E., and Ponder, E. An evaluation of the effectiveness of an enriched curriculum in overcoming the consequences of environmental deprivation. Project No. 5-0342, Grant No. OE-5-10-045, 1971.*

Purpose

To examine the effectiveness of an enriched curriculum on various measures of cognitive development, including six subtests of the revised ITPA, for black children from urban ghettos.

Subjects

Children were black, English speaking residents of New York City, from low SES homes. A control group was selected randomly from those eligible for the program. Children were studied longitudinally from pre-kindergarten through third grade.

Procedure

While longitudinal studies were made with other instruments, the revised ITPA was used only to compare performance of experimental children (E), and control (C) children at first, second and third grades. Six subtests, listed below, were used.

Results

Scaled scores for Auditory Reception, Visual Reception, Auditory Association, Visual Association, Visual Closure and Sound Blending, and total score on these subtests were subjected to analysis of variance. The Experimental group scored significantly better than the Control group on the Visual Reception ($p < .05$), Auditory Association ($p < .01$), and Sound Blending ($p < .01$), and, also, on the total score ($p < .005$).

Comments

The findings on the revised ITPA supported those using other instruments that the experimental enrichment program produced positive and lasting gains over those observed in the control group children who did not experience the program. Since attrition of subjects was high, the control group performance was higher than that generally observed in the community since the control remaining had highly stable residence.

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* Only those aspects of this study which pertain to use of the revised ITPA has been reported here.

De La ey, P.R., Nurcombe, B., Taylor, L. J., and Moffitt, P. Effects of enrichment preschooling: an Australian follow-up study. Exceptional Children, 1973, 40, 171-176.

Purposes

The purpose of this study was to determine the immediate and long-term effectiveness of a preschool enrichment program for both white and Aboriginal children in Australia.

Subjects

The subjects of the study included thirty-six 5 to 6 year old children who attended kindergarten, with 36 children who did not attend preschool. There were 21 white children and 15 Aboriginal children in each of the groups.

Procedure

The children were administered the Peabody Picture Vocabulary Test, the Nixon test and three tests (Auditory Association, Visual Association, and Grammatic Closure) from the ITPA.

Results

The results indicated that preschool enrichment was successful in creating an initial improvement in test performance for both the white and Aboriginal groups on tests of vocabulary, audition, association, grammatic closure, and operational thinking. Tests repeated eight months after the preschool age when the children were in the primary grades showed deterioration on auditory association and grammatic closure, but little deterioration on vocabulary or operational-thinking. Scores for the blacks eroded more than scores for the whites.

Comments

These results are in conformity with results found in the United States in studies of disadvantaged children. It appears that for permanent improvement it is necessary to give a prolonged period of stimulation over many years possibly from ages 5 to 9.

Hines, B. W. Detailed analysis of the language development of children in AEL'S preschool education program. Appalachia Educational Lab., Charleston, West Virginia. December, 1971. Technical Report No. 15.

Purpose

To measure with the ITPA language skills developed through the curriculum of the Appalachia Preschool Education Program developed at the Appalachia Educational Lab (AEL).

Subjects

Data were collected from a sample of 300 preschool children in June and September, 1970, as a pre-test and in June, 1971, as a post-test. The sample was comprised of three treatment groups and a control group. Treatment groups were: (1) a group involved in a mobile classroom once a week, who received weekly home visits from a paraprofessional and viewed a daily television program; (2) a group visited weekly by a paraprofessional and watched the television program; (3) a group who only watched the television program. A control group consisted of 120 children. Children were aged from 3 to 5 years.

Procedure

The principal statistical technique was univariate analysis of covariance on post-test scores, using chronological age and PPVT raw score as covariates. An analysis of variance and a gain-score analysis were also performed.

Results

1. On the Verbal Expression subtest, the differences between treatment group mean scores were statistically significant. A Dunnett's post-hoc comparison reveals that the television only group scored significantly below the television-mobile classroom-home visit group. A significant difference between the sexes was evident; in every case the females outscored the males.

2. On the Manual Expression subtest, a significant treatment effect was evident. All three treatment group means were significantly higher than the control group mean, and the television-home visit-mobile classroom was higher than the other two treatment groups.

3. On Grammatic Closure, differences among treatment groups were evident but not statistically significant. Males outscored females in every group except the television-home visit group, large differences occurring only in the control group.

Results (Continued)

4. On Visual Sequential Memory, there were statistically significant differences between means with the television only group scoring highest. This was explained as an effect of the lower SES of the television group.

5. The differences between overall ITPA means for the treatment groups were not statistically significant, while the differences between sex were ($p < .05$).

6. Children exposed to AEL'S program evidenced increased ability to express themselves non-verbally (by pantomime) one of the frequently taught areas of program curriculum. A primary area of program effect was that of expressive language.

Comments

This study suffers through inadequate reporting of details of assignment of children to the treatment groups. The covariance analysis tended to minimize differences between groups while the simple ANOVA revealing significant treatment effects for all variables. It appears that the major effect of the AEL program was in the area of expressive language.

Jones, E. H. The effects of a language division program on the psycholinguistic abilities and IQ of a group of preschool disadvantaged children. Unpublished doctoral dissertation, University of Arkansas, 1970.

Purpose

To determine the effects of a group language development program using the Peabody Language Development Kit (PLDK) on psycholinguistic abilities as measured by the revised ITPA. A secondary purpose was to determine whether or not IQ (as measured by WPPSI) was significantly increased following experimental treatment. The significance of sex in relation to changes in psycholinguistic abilities and IQ following experimental treatment was also evaluated.

Subjects

Subjects were 26 rural, white preschool children, ages 4 to 6 who attended the Springdale, Arkansas Day Care Center, and who were from disadvantaged homes.

Initial testing was done in October, 1968 with the WPPSI and the revised ITPA. This was followed by a "wait" period, during which subjects participated in the on-going program at the Day Care Center. This period was terminated when the second testing program began, including the WPPSI and ITPA were given again. The experimental design used each S as his own control. The "wait" and treatment intervals were equal for each child, the mean value being 85 days.

Results

1. The analysis of variance of ITPA Composite Scaled Scores for the 26 subjects under the Poverty Guideline revealed a significant difference between "wait" and treatment periods.

2. Individual comparisons of differences between ITPA subtests means revealed differences between scores from the first and second testing periods and 2nd and 3rd testing periods but no statistical tests were made. (Table G-1).

3. The analysis of variance for the WPPSI Full Scale Verbal and Performance scores for the 26 subjects revealed a significant F ratio for the treatment factor.

4. A check on retesting effects by an independent examiner gave no indication that practice effects or examiner bias were significant.

Conclusions

1. Both the ongoing program and the PLDK, level #P (the experimental treatment program) were effective in bringing about increases in the psycholinguistic abilities of this group of children.

2. Children from deprived homes responded favorably, in terms of significantly increased scores on test of psycholinguistic abilities and IQ scales, to traditional nursery-school-kindergarten programs also.

Comments

It is difficult to draw conclusions about the relative effectiveness of the traditional and structured programs. However, the ITPA appeared to provide a sensitive way of measuring growth in curriculum areas which are of great importance for preschool development.

Lavin, C. M. The effect of a structured sensory-motor training program on selected cognitive and psycholinguistic abilities of pre-school disadvantaged children. Unpublished doctoral dissertation, Fordham University, 1971.

Purpose

This investigation sought to determine the effect of a Delacato type sensory-motor training program on the psycholinguistic and intellectual abilities of pre-school disadvantaged children.

Subjects

The subjects were 54 pre-school children living in Harlem in New York City, half of whom were randomly assigned to a control group, and one-half to an experimental group.

Procedure

The revised ITPA and the PPVT were administered twice to each subject within a six-month test-retest interval. Initial analysis of differences in mean age, IQ score, and total psycholinguistic ability score revealed no significant differences between the control and the experimental group. The experimental group attended for six months an 8 hour day nursery school program of sensory motor training according to the rationale of Delacato. The control group children remained at home with no special treatment.

Results

1. Experimental group subjects scored significantly higher than control subjects in general psycholinguistic ability and on the four ITPA subtests of Visual Reception, Visual Sequential Memory, Auditory Association, and Visual Association.

2. No significant differences were found between groups on mean intelligence score or on the other 8 tests of the ITPA.

Comments

The conclusion of the author that no difference was found in intelligence scores (based on PPVT) might be contradicted by the significant difference found on the ITPA total score. Furthermore, the subtests of Auditory Association and Visual Association, in which differences were found, correlate highest with Binet IQ's. This kind of research does not determine the efficacy of a method since the Hawthorne effect is not controlled.

Moffitt, P., Nurcombe, B., Passmore, M., McNeilly, A. Intervention in cultural deprivation: the comparative success of preschool techniques for rural Aborigines and Europeans. Australian Psychologist, 1971, 5, 51-61.

Purpose

This study was an evaluation of a pre-school intervention program for Australian Aboriginal children.

Subjects

Forty-four children (22 Aboriginal and 22 Europeans) from a rural setting of Australia (Bourke, New South Wales) constituted the sample. The mean age at the time of testing was 52 months with a range of 42 to 56 months.

Procedure

Subjects were divided into four groups roughly matched for ethnic descent and verbal quotient (PPVT score). Two groups were exposed to a "traditional" pre-school program involving free play, creative expression, and unstructured verbal stimulation in a sensorimotor context. The remaining two groups received direct language instruction based on the Bereiter-Engelmann program. Each group attended the pre-school for 2 hours per day. Two teachers were used, each one teaching 2 classes per day, one traditional and one structured. The classes were switched from morning to afternoon three times during the year to allow for morning vs. afternoon attention span.

Pre- and post-tests administered within an 8 month interval included the revised ITPA, Form B of the PPVT, and the Vocabulary and Geometric subtests of the WPPSI. Data were submitted to "t" tests.

Results

1. Both structured and traditional groups made significant gains on the ITPA as measured by the mean scaled score of each group.

2. At the beginning of the program there was no significant difference between the group mean scaled scores of the structured and of the traditional groups; following the pre-school program there was a significant difference ($P < .05$) in favor of the structured group. The structured group made significantly more progress on Visual Reception, Auditory Association, Verbal Expression, Manual Expression, Grammatic Closure, and Visual Closure subtests.

3. IQ as measured by PPVT did not increase significantly for the traditional group, but an increase of 25 IQ points was significant at the .005 level for the structured group.

Moffitt, P., Nurcombe, B., Passmore, M., and McNeilly, A.

Results (Continued)

4. The Vocabulary subtest of the WPPSI showed significant gain for the structured group (.005 level).

Comments

The structured preschool program appears to produce improved test scores in its subjects. These results are in harmony with other studies indicating the increased performance of chilren given preschool experience programs.

Saudargas, R. A., Madsen, C. H., Jr., and Thompson, F. Prescriptive teaching in language arts remediation for black rural elementary school children. Journal of Learning Disabilities, 1970, 3, 364-370.

Purpose

The purpose of this study was to determine the effects of prescriptive teaching based on psycholinguistic diagnosis.

Subjects

Subjects were thirteen 8-year-old black, rural, culturally different children (8 experimental and 5 control) from a Leon County, Florida, public school who had been identified by their teachers as retarded in reading and language skills.

Procedure

All subjects were given pre- and post-testing of the Sheldon Reading Inventories and the revised ITPA in February and May. The remediation was conducted during March, April, and May. The eight experimental subjects were involved in a language arts program emphasizing (1) psycholinguistic remediation of language disabilities based on individual ITPA profiles, (2) linguistic patterning, and (3) sound blending. The control group was involved in the regular program--an individually prescribed program using programmed series and basic skill texts. The experimental subjects were tutored 15 minutes a day, 3 days a week, by Florida State undergraduates in homogeneous groups of 2 to 3 children. A reinforcement program was in effect in the classroom for both groups. Scores were analyzed by the Mann-Whitney U Test.

Results

1. Post-test ITPA results showed the experimental group was significantly higher than the control group ($p < .001$) on total Psycholinguistic Age.

2. Significant differences ($p < .05$) in favor of the experimental subjects were obtained on Auditory Association, Visual Closure, Visual Sequential Memory, and Sound Blending subtests.

3. In reading the experimental group gained 9 months, and the control group 6 months, both gains were significant at the .05 level.

Comments

Significant improvement in reading by the experimental group cannot be attributed to any one variable because their treatment consisted of emphasis in three areas--psycholinguistic skills, linguistic patterning, and sound blending. The small n of 8 experimental and 5 control subjects renders any results tentative.

SECTION H

SHORT REPORTS

Cicirelli, V. A note on the factor analysis of disadvantaged children's Illinois Test of Psycholinguistic Abilities and achievement test scores. The Journal of Experimental Education. 1972, 41, 5-8.

Principal component analysis were made of ITPA and MRT (Grade 1) or SAT (grades 2 and 3), for white and black children from Head Start programs. Similar patterns were found for the first two rotated components. Factor 1 was an achievement factor, with loadings from Auditory Sequential Memory, Auditory Reception, Auditory Association and Grammatic Closure, white factor II was a language factor, with sizable loadings from all ITPA subtests, though the two sequential memory subtests are less marked.

Garrison, M., Jr., and Hammill, D. D. Who are the retarded? Exceptional Children, 1971, 38, 13-20.

This study on using multiple criteria for selection of children for placement in classes for the mentally retarded included reliability coefficients for two ITPA subtests (Auditory Reception and Verbal Expression) and intercorrelations among these subtests and other tests.

Rasmussen, J. The ITPA: an examination of the background and development. Unpublished manuscript, Copenhagen, Denmark, 1970.

This pilot study was devised to evaluate a Danish version of the revised ITPA and to compare both rural and urban Danish children to U. S. standardization norms.

Sharp, E. Y. The relationship of visual closure to speechreading among deaf children. Exceptional Children, May, 1972, 38, 729-34.

This study investigated whether good and poor young deaf speechreaders differed in ability in visual closure, movement closure, and short term visual memory. Significant differences in test performances were found for the following tests: Visual Sequential Memory, Visual Closure, Porteus Mazes, Hidden Figures, and Rhythm Patterns.

Shriner, T. H., and Daniloff, R. G. Reassembly of segmented CVC syllables by children. Journal of Speech and Hearing Research, 1970, 13, 537-47.

This study investigated time intervals between sounds in the perception-resynthesis performance of children. The authors believe that the revised ITPA Sound Blending subtest uses too large an interval between sounds.

Works, M. N. Some variables involved in the reading process. Unpublished doctoral dissertation, University of Oklahoma, 1970.

This investigation of the relationships between rhyming (as measured by the Works Bratner Ability to Rhyme Test) and reading and between rhyming and performance on common predictors of academic success found that rhyming was not statistically related to reading as measured by the WRAT. There was found a significant relationship between rhyming performance and individual subtests and total scores of the Frostig, WPPSI, ITPA, and Metropolitan Readiness Test.